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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

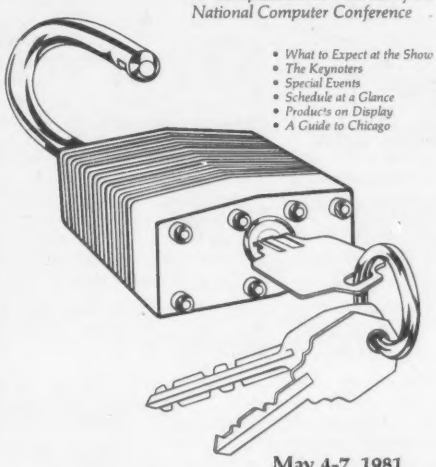
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NEWSPAPER

NCC '81
Keys to Productivity

A 'Computerworld' Preview of the National Computer Conference



- *What to Expect at the Show*
- *The Keynoters*
- *Special Events*
- *Schedule at a Glance*
- *Products on Display*
- *A Guide to Chicago*

May 4-7, 1981
McCormick Place
Chicago

NCC '81 blows into the Windy City next week, and *Computerworld* will be there. A 91-page preview follows Page 82.

IBM Suit Must End June 1, Judge Says; Denies Mistrial

By Bob Johnson
CW New York Bureau

NEW YORK — Presiding Judge David N. Edelstein has set a June 1 deadline to end the nation's longest running antitrust trial, U.S. vs. IBM.

At the same hearing in federal district court here last week, Edelstein denied IBM's recent motion for a mistrial or dismissal of the 12-year-old suit. The motion was based on a Supreme Court ruling in Upjohn vs. U.S. concerning the confidentiality of attorney-client privileges [CW, April 20].

"I take a very dim view of this motion at this juncture to declare a mistrial or dismiss the complaint. The motion is denied," Edelstein said. "It may be viewed together with other motions to dismiss when the trial is concluded."

Edelstein's call for an end to the trial by the ordered date marked the first time he had done so on public record. "I don't care if you get more help. I don't care if you work morning, noon and night. This is in effect my ruling: May 30. That's it," Edelstein said.

Edelstein added that he would not yield on that date "except for very satisfactory and compelling reasons in the interest of justice."

Edelstein offered his services in an effort to make an out-of-court settlement for both parties, saying that he is in a position that gives him the knowledge and familiarity with the case to assist in such a settlement. He noted that U.S. attorneys have not been directly involved in the trial from the start; only Thomas D. Barr, IBM's lead attorney, and he (Edelstein) have been, Edelstein said.

(Continued on Page 8)

Pacific Tel Innocent Of Stealing Software

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — A West Coast telephone company and one of its East Coast business partners have been found innocent of stealing and divulging a local computing-service firm's proprietary software and procedures.

By a 10-2 verdict, a superior court jury here has exonerated Pacific Telephone and Telegraph Co. of allegations that it stole and deliberately disclosed trade secrets belonging to Tele-Count Engineers, Inc., which develops and supplies technology for counting telephone cable pairs.

The jury also exonerated Vernon Graphics, Inc., a New York-based cable-counting firm to which the phone company allegedly gave the stolen Tele-Count secrets.

Tele-Count's complaints against Pacific Telephone and Vernon Graphics were outlined in an $8 million civil law suit that was filed Jan. 29, 1976, and was decided April 10 after a complex eight-week trial.

The origins of the Tele-Count vs. Pacific Telephone suit can be traced to 1971, when the plaintiff contracted with the phone company and one of its subsidiaries, Bell Telephone Co. of Nevada, to count cable pairs.

As part of the contract, Tele-Count agreed to make its cable-counting programs, processes, methods and

(Continued on Page 4)

DP Department's Top Priority

Atlanta Manhunt Broadens Scope

By Bill Laberis
CW Staff

ATLANTA — Investigators here are broadening the scope of their computer-assisted manhunt as the death toll in the Atlanta child slayings continues to mount.

With 25 black youths found murdered over the last 20 months, local, state and federal investigators are relying more now than ever on the city's DP resources to sort out the thousands of clues and tips that flood in weekly.

Atlanta DP director Samit Roy, who has given the investigation "top priority" in his shop, said the city's twin IBM 3031 mainframes are working overtime on the case, processing over 1,200 clues phoned into investigators daily [CW, March 2].

Details Withheld

He added that neither he nor the police will divulge much of the technical details of the computer investigation for fear of jeopardizing police efforts. It is generally conceded to be the broadest computer-aided criminal investigation ever.

"But when the case is solved, I will be very happy to tell the whole detailed story of all the innovative ways we have used our computer resources," Roy said. "It is a system that I will make available to other cities if they want, some little bit of good that might come of all this."

Roy did say that police are "using the hell out of the system," accessing the growing data base of names, addresses and criminal records from remote terminals in po-

(Continued on Page 4)

AT&T Plans to Use Telidon For All Future Videotex

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — AT&T has decided to base all of its future videotex systems on Canada's Telidon formatting scheme, a phone company official reported last week.

Robert Sanders, a communications systems planner in Bell's residence marketing division, indicated that within the next year Bell will begin testing the first of the new systems in Coral Gables, Fla. A 125-page specification describing an AT&T-modified version of the Telidon protocol has already been written, Sanders added, and it will be disclosed publicly during a videotex conference in Toronto next month.

The specification will be offered to suppliers of videotex/teletext hardware/software in expectation they will incorporate it into their own products. Asked how long Western Electric, AT&T's manufacturing arm, would need to implement the new specification, Sanders said, "About a year."

The terminals now being used in the Coral Gables videotex trial — a joint venture involving AT&T, Southern

(Continued on Page 6)



CW Photo by P. Segal

A New Age Dawns

Practicing what it preaches, *Computerworld* computerized this month, and there was no user resistance at all — well, almost none. Editorial assistant Susan Blakeney had a few rough moments. Story begins on Page 11.

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Editor E. Drake Lundell Jr.
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News Editor Cheryl M. Gelb
Senior Editors:
Industry Marcia Blumenthal
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Barbara T. VanScoyoc
Donovan White
Editorial Assistants Susan M. Blakeney
Cheryl Brady
Editorial Cartoonist Jim Orton
Contributors:
Education J. Daniel Couger
Taylor Reports Alan Taylor
Human Connection Jack Stone

For Sales, Circulation and Production contacts, see inside back page.

Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153

OTHER EDITORIAL OFFICES:

New York City: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Telephone: (212) 570-2135.

West Coast: 257 Lytton Avenue, Palo Alto, California 94301. Phone: (415) 328-8064.

Washington, D.C.: 821 National Press Building, 529 14th Street N.W., Washington, D.C. 20045. Phone: (202) 347-6718.

England: Steve Burton, IDG Publishing Ltd., 146 Clerkenwell Road, London EC1 Phone: 01-837-1222. Telex: UK-269477.

W. Germany: Eckhard Utpadel, CW Publikationens, Friedrichstrasse 31, 8000 Munich 40, Phone: (089) 34-90-61. Telex: 5215350.

Asia: Hidetsuna Sasaki, Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 455-6101. Telex: J2424461.

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex: SECCO AA25468.

Brazil: Eric Hippeau, Data News, Computerworld do Brazil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130838(WORD BR).

Mexico: Kevin Kelleghan, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F., Phone: (905) 514-4218, (905) 514-6309.

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Launch Delay Sparks Debate

New Software for Space Shuttle?

By Tim Scannell
CW Staff

JOHNSON SPACE CENTER, Texas — While the space shuttle *Columbia* is dusted off and readied for a second excursion into space later this year, National Aeronautics and Space Administration (Nasa) officials here continue to debate whether to change the shuttle's software to avoid problems similar to the one that postponed the originally scheduled launch.

A special Nasa task force, which includes representatives from Rockwell International, Inc. and IBM — the two companies responsible for the design and programming of the shuttle's six on-board computers — has been working with *Columbia*'s software since a problem cropped up just minutes before the planned launch on April 10. At press time, no decisions had been made to change the software of the IBM System/4 Pi Model AP-101 aviation computers.

The problem apparently involved a timing error between two of the shuttle's five primary computers and the backup system. The sixth computer, used mainly as a "spare-tire" system in case all the other computers failed, was not involved in the error.

About 20 minutes before the launch, as each of the computers was being initialized, the backup unit began sending data to the two primary machines about 41 msecs before the computers were ready for it [CW, April 20]. Basically, this resulted in the backup computer turning itself off because the data sent and the data received did not match.

Nasa learned later that the astronauts could get around the problem by reinitializing the computer systems and reloading the software programs.

The annoying timing problem, which delayed the launch by two full days, occurs only under very rarely encountered conditions, according to an IBM spokesman familiar with the on-board systems.

"They [Nasa] know what causes it, they know what to look for and it can be easily verified," the spokesman said. "If the computers are in step as they start up . . . they stay that way throughout the mission."

However, if Nasa officials decide to alter the software in any way for future shuttle missions, changes will be considered to prevent another timing problem, he added.

DPMA Mustering Challenge To Bay State's Software Sales Tax

PARK RIDGE, Ill. — The Data Processing Management Association (DPMA), long a lobbier against software taxes, has sent letters to its more than 500 Massachusetts members in an effort to generate a concerted reaction to the recent imposition of a 5% software sales tax there [CW, March 30].

"The Massachusetts Department of Revenue on March 9 adopted a regulation to collect sales taxes on software and data processing services excluding timesharing," the letter, signed by DPMA international president Roger Fenwick, begins.

"This regulation is not in the best interest of our members and their employers and we therefore are opposed to it.

"We therefore request your immediate assistance as follows: (1) inform your company's executive or executives of the regulations, (2) obtain a commitment of your company's support for a legal challenge of the regulations and (3) convey the commitment to DPMA's Massachusetts legislative network representative, Ardyn Dubnow."

Dubnow, who will act as coordinator, can be reached at 74 Cynthia Road, Framingham, Mass. 01701.

Readers Beware

If you're a *Computerworld* subscriber in the Midwest or Northeast, you may have been plagued recently by phone calls from persons claiming to represent CW. These callers offer free CW subscriptions in exchange for the names of your programmers and analysts. When asked to leave a name and telephone number, they give the name of a CW editor and our phone number or a fictitious name and number.

CW makes no such phone solicitations asking for names of your programmers and analysts, nor do we offer free subscriptions. With the exception of news reporting, marketing and editorial research, projects are conducted through the mail on our letterhead.

Should you receive such a phone call, we urge you to provide no information to the caller. However, any information that could lead to the apprehension and vigorous prosecution of these individuals should be relayed to Roy Einreinhofer, vice-president, CW, at (617) 879-0700. Or write to him at 375 Cochituate Road, Box 880, Framingham, Mass. 01701.

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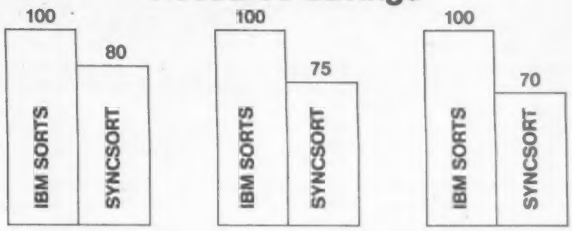
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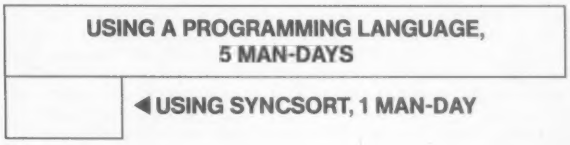
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Milan: SYNTAX, (39-2) 87. 74. 44
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Injunction Halts Computerized Trading Scheme

By Lois Paul
CW Staff

MIAMI — A South Florida stockbroker accused by the Securities and Exchange Commission (SEC) of bilking investors of at least $53 million in a computer-based investment scheme was slapped with a preliminary injunction by a federal judge here, halting his investment program.

The SEC has accused Dennis Greenman, a former senior vice-president of Barclay Financial Corp., of falsifying account statements, misrepresenting investors' holdings and switching millions of dollars around in what they described as "a massive fraud."

Documents filed with the federal court by the Federal Bureau of Investigation said that there also is evidence of mail fraud in Greenman's activities.

Greenman allegedly operated a computerized series of stock-option trading programs for hundreds of investors who were organized into limited partnership. General partners who recruited participants often earned 50% of the profits.

More than 400 investors had put money into the scheme. SEC said Greenman intercepted trading account reports from Barclay's clearing broker, A.G. Becker, Inc., and substituted phony statements of his own.

Computer Con Man

The hearing was held on April 16 before U.S. District Judge William Hoeveler. At that time, SEC attorney Joseph L. Grant described Greenman as "the Ponzi of the computer age," likening him to con man Charles Ponzi, who defrauded victims of millions of dollars in 1920 by borrowing from some to pay others in an ever-growing scheme.

"We have found 400 investors who invested with Barclay [through Greenman] and we're still counting," Grant told Hoeveler. "We found $53 million in [counterfeit] assets and we believe there are substantially more out there."

Grant said he and other investigators for the SEC and the FBI had discovered more than $39 million in investor holdings and account balances, along with nearly $91 million in reported assets. The difference — nearly $53 million, he said — represented holdings "that were totally false."

Details on the actual use of the computer remain sketchy. It is believed that Greenman used it in a short-term trading plan, known as day trading. The technique is to try to capitalize on the fractional price differences between options traded on different exchanges.

An option, for example, that is quoted at $4.34 on one exchange at a given time on a given day might be trading at $4.67 on another. With quick action, it is possible to buy on one market and sell on the other.

The prospect of earning profits on this type of transaction through the pooling of large amounts of capital attracted investors from several states and from the cities of Atlanta; Jacksonville, Fla.; Tampa, Fla.; and Miami. Some people profited — for a while.

Start of Scheme

Greenman allegedly started his short-term trading concept nearly four years ago, when he worked for Merrill Lynch in Jacksonville.

Later he was associated with Paine Webber in Miami. For the past year, he has worked through Barclay Financial, a relatively new discount brokerage firm.

As part of its attempt to search Barclay's file, the FBI produced an affidavit for a search warrant, which contained depositions from a number of those involved in Greenman's program.

One investor, Bruce Meiselman, said he attended a seminar in Jacksonville, which Greenman held to explain the operation of the short-term trading program.

At that time, Greenman, on behalf of Barclay Financial Corp., stated he had access to a computer that was able to discern disparities on various stock markets, and it was by taking advantage of this information that the program was able to make huge profits.

Many of these disparities reportedly were in stock options. Some of them were in specific stocks.

At some point, which is not yet clear, the scheme failed. Greenman then allegedly kept the investors pacified with phony statements on their earnings.

The accounts were turned over to a receiver, Miami attorney Hugo Black Jr. Hoeveler also ordered Greenman's lawyer, Robert Paul, to compile a list of Greenman's assets and to guard against any transfer of the broker's property.

Investor Returns

At the hearing, Black said he had recovered nearly $26 million in cash, stock and options contracts that belong to Greenman clients and participants in the partnership programs. Early indications reportedly are that the participants in the Greenman options trading programs will recover less than 50 cents on the dollar.

Paul said investors in Greenman's short-term trading programs were "thoroughly greedy [people] who poured money in and asked no questions." He said some made tremendous profits.

Grant detailed numerous examples of specific Greenman accounts whose funds, he said, were "misappropriated." He described one case in which Greenman, without authorization from the general partner of Mega Trading Ltd., allegedly diverted $128,000 to the broker's father-in-law. In another, Greenman was accused of turning over $746,14[illegible] from Bold City Associate's account to a woman who was not in the program.

According to the *Miami Herald*, a grand jury in Tampa is investigating possible criminal charges against Greenman. He did not appear at the April 16 hearing.

The FBI stumbled onto the alleged securities fraud while investigating Tampa developer Allen Wolfson. In subpoenaing Wolfson's bank records, they traced some of his funds to Barclay Financial. He was one of the investors in options trading programs set up by Greenman.

Pacific Tel Found Innocent Of Stealing Software

(Continued from Page 1)

forms available to the phone company, which in turn was asked not to disclose the proprietary technology to any of the plaintiff's competitors. Pacific Telephone reportedly assured Tele-Count, in both oral and written form, that it would do nothing to compromise the trade secrets' confidentiality.

But in March or April 1973, the phone company apparently ignored its previous assurances and divulged the plaintiff's cable-counting technology to Vernon Graphics, the suit alleged.

Soon afterwards, Pacific Telephone awarded Vernon Graphics the first of two cable-counting contracts, both of which were allegedly fulfilled with the help of the stolen Tele-Count trade secrets.

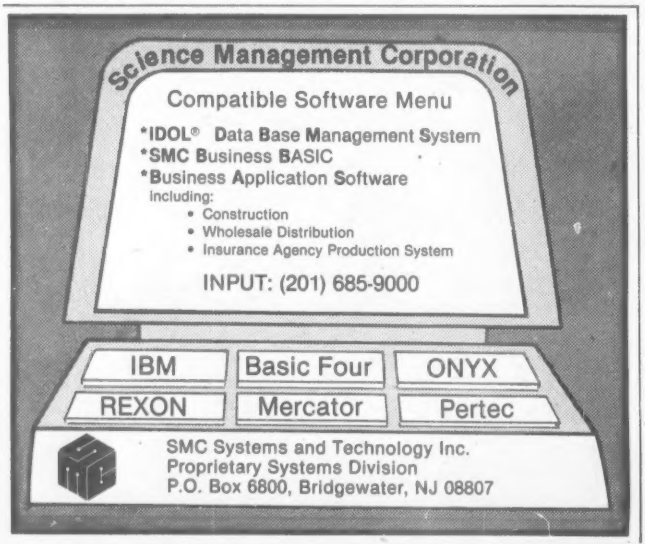
'Valuable Assets'

Tele-Count reportedly developed its secret programs and procedures at "considerable expense" and regarded them as "valuable assets" that gave the firm a competitive edge over Vernon Graphics and other rival cable-counting firms. So when the plaintiff first learned of the alleged trade-secrets theft and disclosure in January 1974, the company decided to file suit.

In its original complaint, Tele-Count accused Pacific Telephone and Vernon Graphics of having committed a "fraudulent breach of confidence" and of conspiring to "destroy the plaintiff's business by wrongful disclosure." In addition, Tele-Count characterized the two codefendants' actions in the case as "malicious and oppressive" conduct that had cost the plaintiff an estimated $185,000 in lost profits.

Besides seeking the $8 million in exemplary or punitive damages, Tele-Count urged the court to issue a permanent injunction barring Pacific Telephone and Vernon Graphics from further use of the allegedly stolen trade secrets.

But after considering the evidence in the case for roughly two months, a 12-member jury rejected Tele-Count's complaints and found the codefendants innocent of any wrongdoing. Exactly how the jury arrived at its verdict has not yet been publicly revealed.



DP Dept.'s No. 1 Priority: Hunt for Atlanta Murderer

(Continued from Page 1)

lice stations and prowl cars.

In a recent development, Roy's department digitized a detailed street map of the city and is using an off-line, batch-fed graphics system to plot suspects' addresses with crime scenes or telephone tips. He said the city is looking into setting up an on-line graphics system accessible on a moment's notice by field investigators.

According to a recently published report in the *Atlanta Constitution*, the data base is being used to determine whether any former Georgia prison inmates classified as homosexuals reside in the areas where the victims last lived.

Investigators, however, said that there has been no link forged between the deaths and possible homosexual involvements. Roy declined any comment on the report, urging the media to "use discretion in reporting on what is obviously a delicate and important investigation."

Government Appeal Likely If AT&T Decree Suspended

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — If AT&T's 1956 Consent Decree is suspended, the Justice Department probably will appeal the decision, a government attorney said here last week.

His comment came shortly after an initial hearing by a federal district court judge in Newark, N.J., on a phone company request for reinterpretation of the decree.

Basically, AT&T wants the court to say that the phone company can offer "enhanced services" on a nontariffed basis, through one or more fully separated subsidiaries, without violating the 1956 decree. Smart terminals and computer-based on-line information offerings are among these services.

The Federal Communications Commission (FCC) has already endorsed such an arrangement in the Computer Inquiry Decision it issued last December. But the Justice Department, along with most of the computer industry, insists the decision conflicts with the decree.

During the hearing in Newark on April 13, Federal District Court Judge Vincent P. Biunno mentioned a number of times that the decree, as adopted in 1956, allows Western Electric to sell terminals (technically, customer-premises equipment, (CPE)) to end users on a nontariffed basis if they are manufactured initially for AT&T operating companies.

His point seemed to be that if these sales were legal in 1956, the decree cannot be construed to make them illegal today under the Computer Inquiry Decision.

'Not a Real Problem'

As the judge put it: "CPE is not a real problem. That could be handled- . . . through a subsidiary of Western Electric" — along the lines specified by the FCC in last December's decision.

Judge Biunno also pointed out that last December's Computer Inquiry II decision is one step in a process aimed at promoting greater competition in the telecommunications business — a step made desirable largely by the vast technological changes that have occurred since 1956. Earlier, AT&T stressed essentially the same points in its petition to the Newark Court seeking a reinterpretation of the decree.

The FCC, in its Computer Inquiry II decision, said there is no longer a need to regulate enhanced services directly; market forces can be relied on to do much of the job, and since these services remain "subject to public regulation" under the Computer Inquiry II decision, the FCC retains power to supplement market forces when necessary.

Under the Consent Decree, virtually all of the services offered by AT&T must be subject to public regulation; thus, one of the key issues in Newark is whether the scheme specified by the FCC satisfies this requirement.

Judge Biunno suggested suspending the decree because several AT&T competitors have appealed the Computer Inquiry II decision, and a decision in the latter proceeding will directly impact the one in Newark.

The Justice Department opposes this move, explained one of the government attorneys participating in the Newark case, because it would "amount to a reconstruction of the decree, in effect if not in fact. AT&T would then be able to set up one or more separate subsidiaries, for example, and could not be cited for contempt under the Consent Decree."

The next act in the drama is expected to begin this week, with the filing of explanatory briefs by several of AT&T's competitors; they have been granted "friend of the court" status by Judge Biunno.

DPMA Plans NCC Debut Of Model Curriculum

PARK RIDGE, Ill. — The Data Processing Management Association's (DPMA) model curriculum for undergraduate computer information systems (CIS) education will be announced on the first day of the National Computer Conference, May 4, in Chicago at a session on "Survey and Comparisons of Model Curricula for Information Systems Education."

The project, which originated in 1979, was to establish a CIS curriculum independent of compûter science curriculum which emphasized information systems in business. The curriculum was developed by industry and academic computer specialists and led by Dr. Thomas H. Athey, chairman of the DPMA model curriculum executive committee. It consists of core courses and electives that define the concentration required for a bachelor's degree in CIS.

Final details are expected to be completed by May 15 and DPMA Education Foundation President Dr. William Hetzel said "a principal goal is to gain national acceptance and implementation of the curriculum."

Copies of the curriculum can be obtained by writing DPMA International Headquarters, 505 Busse Highway, Park Ridge, Ill. 60068.

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Or Retrial of Glovatorium Suit

NCR Seeks Reversal of $2 Million Fraud Verdict

By Bill Laberis
CW Staff

SAN FRANCISCO — NCR Corp. will return to federal court here this Friday seeking either to reverse a recent $2.3 million fraud and breach of contract verdict against it or to gain a retrial.

In its 56-page brief, the company has asked U.S. District Court Judge William Schwarzer to eliminate or reduce the $2 million in punitive damages awarded last month to The Glovatorium, an Oakland, Calif., suede and leather cleaning company.

During the 10-day trial, a jury found that NCR had willingly misrepresented itself by selling The Glovatorium a $60,000 System 8200 minicomputer and Spirit software package that it knew would not work as promised and then tried to cover its tracks by willfully defrauding the user further [CW, April 6].

Should the verdict and award stand, it could possibly be the largest ever fraud judgment returned against a computer manufacturer.

Two Motions

The latest court action in the suit will be on two NCR motions: a request for a judgment notwithstanding the verdict (Jnov), and a motion for a retrial.

The Jnov asks Judge Schwarzer to render a verdict in NCR's favor apart from the jury's finding. The request is made on the basis that the company feels the evidence presented in the trial was stacked heavily to NCR's credit, despite the jury ruling and subsequent award.

The separate motion for a new trial is based on several issues raised in the original trial. The motion may, in fact, be granted, which means the entire case could be retried or just certain parts of it, according to Richard Perez, The Glovatorium's attorney.

NCR lawyer William Irvin has said previously that the company would carry the case to the U.S. Appellate Court should the two recently filed motions fail, thus setting the stage for a protracted court battle.

"We knew before the trial that any judgment in our favor would be appealed, to soften the blow of the verdict if for no other reason," Perez said. "Frankly, we're not too concerned about either of the motions NCR has filed at this time."

Meanwhile Perez reported that he has received phone calls from other System 8200 and Spirit users, and that there is "a good possibility other suits against NCR will follow."

Because of the impending court action Friday, NCR would offer little comment other than to confirm the latest filing of motions.

AT&T to Base Future Videotex on Telidon

(Continued from Page 1)

Bell and Knight-Ridder Newspapers — were built by Western Electric. Those presently installed employ a data-formatting scheme based on Britain's Prestel/Viewdata system. Since Britain and Canada, as well as France, are vigorously competing to get their technologies accepted in the U.S., AT&T's choice of Telidon represents a major triumph for Canada, and possibly the end of the competition.

Future Enhancements

According to sources in this country, AT&T and Canada's Department of Communications (DOC) have signed an agreement providing for joint development of future Telidon enhancements. There is a good chance these enhancements will include electronic messaging, teleconferencing and several other capabilities.

DOC officials, when asked directly whether such an agreement has been signed, said only that "discussions" between the department and the telephone company are "under way" and there is a "likelihood" AT&T will adopt the Telidon data-formatting protocol.

Details of the reported joint development agreement were not disclosed, but some clues are provided by a technical paper to be presented at the Videotex '81 conference in Toronto next month — the meeting at which AT&T will announce its support of Telidon.

The paper's author is H.G. Bown, DOC's information technology director. He played a key role in development of the Telidon system. According to a member of Bown's staff, who summarized the paper, it will discuss a number of "near-term" enhancements which the Canadians are now working on. These enhancements include:

• Electronic messaging and teleconferencing capability. Telidon terminals would communicate directly with each other, rather than going through a central computer. Besides transmitting text, which could be stored at the sending or receiving terminal if the recipient was unavailable, this application also would allow for what Bown called "sharing of a common visual space" — i.e., display of the same graphic or pictorial image by a number of terminals.

• "Picture manipulation instructions." Present Telidon terminals have some animation capability, but they leave much to be desired. According to an associate of Bown, "the animated displays we can show today are reminiscent of early movie cartoons. Our ultimate goal is to present moving pictures as good as those you can see today in a theater."

In his technical paper, Bown calls the near-term development of picture manipulation instructions "a fundamental approach" to realization of this long-term goal. The instructions, resident in the user's terminal, will permit displays — after being received — to move automatically in a smoother, more continuous fashion than is possible now.

Moreover, the instructions will permit the user to manipulate still pictures by inputting commands through his keyboard. He will be able to erase parts of the picture automatically, for example, move it around the screen and enlarge or reduce its size.

• Downline loading capability. One possible application involves transfer of the software needed to support video games and personal computing applications. Another involves transfer of special character sets needed for engineering, scientific and similar applications. The Telidon terminal would thus become a multipurpose device, not solely a means of accessing a remote database. And, by permitting the terminal to operate on a stand-alone basis afterward, this downloading capability would enable the central computer and the network to provide better service.

• Memory enhancements. In existing videotex systems, information desired by the user frequently must be displayed on a number of successive TV frames ("pages") and he must access each one separately. "Near-term future" Telidon terminals will have additional memory to store the second and subsequent pages, thus reducing access time.

• "Color look-up tables." They will permit a vast increase in the number of colors that can be displayed on the screen of a Telidon terminal, thus enhancing the value of tele-shopping and similar services.

Disclosure of AT&T's plans for implementing a videotex protocol based on the Telidon data format came after stories appeared in U.S. and Canadian publications saying AT&T was planning to propose Telidon to the Federal Communications Commission (FCC) as a U.S. national standard.

Sanders said no decision to do that has yet been made. He indicated it would not be necessary to go to the FCC. The implication was that AT&T, by offering its recently drafted technical specification to videotex/teletext suppliers, would get the related formatting scheme adopted in this country as a de-facto standard.

However, the phone company is apparently planning to promote the specification as an international standard. Sanders is AT&T's delegate to Study Group A, a U.S. group that represents this country at meetings of CCITT, the international standards-setting body for telecommunications authorities in several countries. The specification has already been presented to Study Group A.

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Cost Drives Bank Away From In-House System

By Lois Paul
CW Staff

AURORA, Colo. — In the fight to control the rising cost of DP personnel, a bank here switched from an on-line, in-house system to a service bureau.

The result? A reduction in monthly DP cost from $54,000 to between $10,000 and $12,000 and a cutback of the DP department from 12 to two people.

"Cost was the major motivation for the change," according to Homer Lyle, president of People's Bank and Trust. "I couldn't see how we could ever make our in-house operation pay off." The bank was able to derive about $14,000 to $15,000 in outside income from work done for other financial institutions; the possibility of increasing this outside income was analyzed, but there simply was no additional work to be found, Lyle said.

Lyle joined the Bank in July 1979, when the expense ledger was not very detailed. "Employee cost, utilities and machinery expense all were comingled with other banking expenses," he explained.

After a period of isolating certain expense items and examining these closely, the bank determined in June 1980 that it had to do something other than continue an in-house DP operation.

"Our in-house computer operated excellently. It produced timely reports and was up almost entirely," Lyle said, noting that only once during his time with the bank had the system been down for about four hours.

Programmer cost was the problem, Lyle said, adding, "It was a difficult thing for me to manage. My background was general. The DP manager could tell me he needs 10 people and I would have no way to judge this." He added, "A $50 million bank probably needs as much DP staff to operate in-house as a $100 million or even larger bank."

The bank had used an IBM 370/125 with 364K bytes of memory. Peripherals included eight Memorex Corp. 3340 disk drives and IBM 3203 printers, 3411 tape drives, 3276 CRT controllers and 3278 CRTs, according to Art Acevedo, data control officer.

Cobol Shop

It was a Cobol shop which had employed four programmers at its peak of activity, he said. Currently, Acevedo and one other person staff the entire DP department.

Lyle said that once the determination to make a change had been made, the bank considered "NCR's package which would have kept our in-house programmers up-to-speed." He said this would have reduced the monthly DP expense, but also would have involved a total replacement of equipment.

There are three service bureaus in Denver, Lyle said, and he narrowed the search to Baldwin Data Services and Colorado Computer. These were equal in all respects, he said, but the bank went with Baldwin because of a close tie with Baldwin-United, the company's parent firm.

Baldwin provided an estimate in October 1980 which, to date, relates to the actual cost "like twins," Lyle said. Conversion began in mid-December 1980. Since the bank owned only its reader/sorter, a first step was to sell this equipment.

"We didn't get hurt too badly on the other equipment by buying out the leases on it and reselling it," he said, noting that all of the equipment is gone now, except for the CPU and a printer which are used in the loan service, which is expected to be completely converted by mid-April.

Baldwin provides demand deposit account, savings and lending systems, as well as an on-line customer information file which is filed by customer number. The service bureau has about 187 employees and uses an IBM 3033 with 12M bytes of memory and an IBM 370/168 with 8M bytes of memory.

Four people support People's Bank, according to John Nickerson, executive vice-president of Baldwin. Interface with Baldwin's system is through Informer, Inc. terminals.

"Everything is on-line, although it is not real-time processing," Nickerson said, noting that data is entered through on-line terminals but batch processed at night.

Nickerson said two other banks in Colorado have approached Baldwin about closing their in-house DP centers and doing business with the service bureau. He cited problems with getting qualified DP people and changing regulations which banks have to contend with as chief motivators for this type of conversion.

"With a service bureau, when regulations change, we can do it one time for all the banks on our system," Nickerson explained.

Problems encountered during the conversion at People's Bank have been training people to the new system and some initial difficulties with response time, according to Lyle.

"The people we have here were long-time employees, middle-management types, who had been accustomed to, and really spoiled by, the old system," Lyle explained.

The two-person DP shop now handles on-line transactions and entering of new accounts. They continue to use the IBM 3276 CRT controller with the 3278 CRT on-line for the general ledger, Acevedo said.

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Adapso Slams Bell's Bid To Offer Zip Code Service

ARLINGTON, Va. — The Association of Data Processing Service Organizations, Inc. (Adapso) has submitted an informal complaint to the Federal Communications Commission (FCC) challenging AT&T's and Southwestern Bell's alleged bid to provide toll-free telephone information services regarding Zip Codes to U.S. Postal Service (USPS) customers.

The USPS has solicited outside bids for a telephone call-up system, by which users could dial a toll-free number to find out the new nine-digit Zip Codes, expected to go into effect in the latter part of 1981.

Adapso claimed that AT&T and Southwestern Bell have submitted a proposal to offer these particular services, although an AT&T spokesman would neither confirm nor deny that allegation.

According to Adapso, the services are "enhanced services" as defined in the Second Computer Inquiry Decision because they involve customer interaction with stored information and a retrieval system. Under the FCC's ruling, AT&T and Southwestern Bell must establish a separate subsidiary in order to bid to provide such "enhanced services" offerings, which to date AT&T has not done.

It is Adapso's contention that AT&T and Southwestern Bell should be investigated by the FCC regarding their alleged involvement in bidding for the expanded Zip Code service to ensure compliance with the FCC's policies.

Without at least the establishment of a separate subsidiary to handle the service, Adapso contends that Southwestern Bell should not be considered for the USPS contract. In the alternative, Southwestern should restructure its offering to comply with the regulations, or at the very least request a waiver procedure as established by the FCC, at which time Adapso and others could comment in detail.

In March, Adapso also submitted an informal complaint to the FCC on AT&T and Southwestern's provision of Electronic Information Service II, which the association contends also violates the FCC's policies.

Judge Says Trial Must End

(Continued from Page 1)

"I offer my services to particpate in the settlement discussion," Edelstein said.

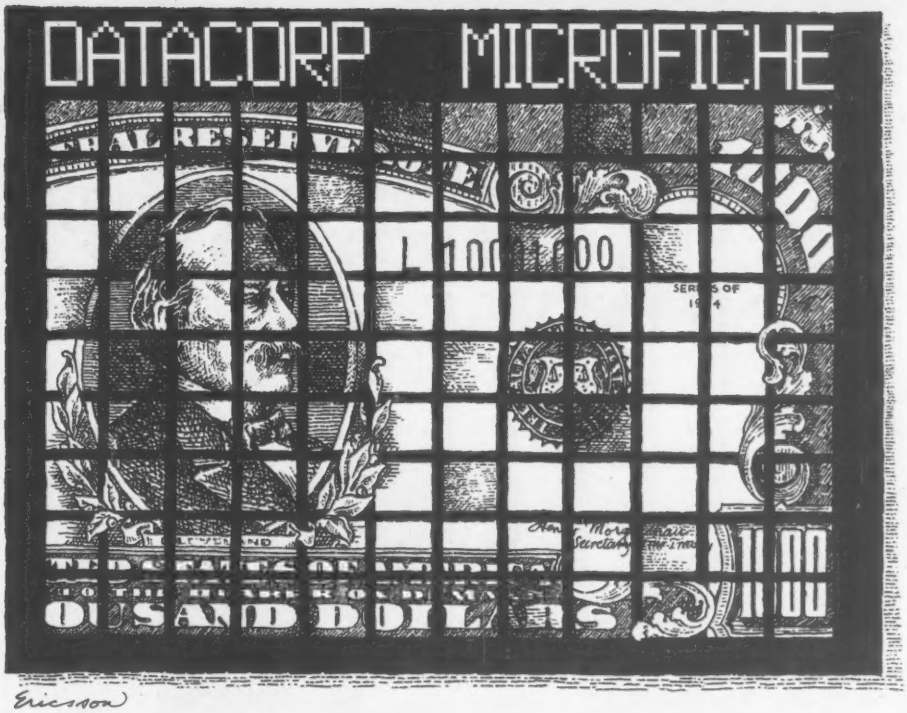
"I will come to Washington as often as I have to . . . I will do whatever I can in order to produce a settlement of this case."

Barr said IBM would have no trouble meeting the June 1 deadline. "I think my client would agree to any kind of negotiation at any time at any place," he said.

Barr did express some reservations about the Justice Department, however. "It is our problem, which I tell you now, that the Department is simply unwilling to negotiate at any time under any circumstances."

Justice Department attorney Donald A. Resnikoff said he would relay Edelstein's offer to Washington.

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In Plant Operations

Study: 80% of Manufacturers Use or Plan DP

By Bruce Hoard
CW Staff

MINNEAPOLIS — Slightly more than 80% of the manufacturers polled in a recent study are using or planning to use computer-based manufacturing systems in their plants, according to Infodyne, Inc.

The 250-page study takes a wide view of computer-based manufacturing practices. It examines such issues as benefits, the reasons for failures, supplier evaluations, usage characteristics, a market forecast and selection guidelines.

Both a user and a supplier survey are included in the report, which was based on input from hundreds of manufacturing companies and more than 100 computer equipment and computer services vendors.

The 80% figure was drawn from the user survey, which examined computerization levels of several manufacturing applications, including two of the most prominent ones, Materials Requirements Planning (MRP) and Master Scheduling.

The survey found 19% of users polled were currently performing the MRP function manually, 5% had no plans to computerize, 22.8% were planning to computerize and 60.8% had already done so.

In terms of planned change, 15.2% had no major changes planned for MRP, while 18.9% were making major changes in the area. Overall, 83.6% had computerized MRP or were planning to do so.

Master Scheduling followed a similar pattern. That function was being performed manually by 21.5% of respondents, while 7.6% had no plans to computerize it and 27.8% were planning to computerize.

In the change category, 18.9% had major changes planned, and 12.7% were making major changes. In the aggregate, 82.2% had computerized Master Scheduling or were planning to do so, the survey found.

Asked to express a preference for processing hardware, the users gave "firms' large computer" a solid mandate, registering 62% favorability. Other preferred categories were "dedicated computer," 22%; "buy time and application software," 13% and "buy time," 3%.

"By specific application," the study stated, "there is a slightly higher tendency to use large in-house computers for shop floor control, capacity requirement planning and purchasing."

Turning to software sources, users gave "in-house, custom-developed" software a 45% approval rating. Following in preference were "buy/lease from software vendor," 24%; "buy as a service (with time)," 13%; "buy/lease from mainframe vendor," 9% and "contracted custom development," 8%.

"Only 45% prefer in-house custom development," the study said, playing down its popularity. "Considering that not so many years ago this was almost 100% and that most companies represented in the study have 'large' DP staffs, this indicates that the other answers must have strong advantages."

Less Than Satisfied

Results from the supplier survey showed vendors to be less than satisfied with most of the products they are offering manufacturers.

Only bills-of-material applications scored well. A plurality of vendors felt their customers were getting less than they deserve in MRP, process and routing, shop floor control and master scheduling applications.

The scope of manufacturing applications offerings ran from the most popular, "software exclusively," (28.6%) to "services exclusively," (5.7%). Filling in were "hardware, software and services," (25.7%); "hardware and software," (14.3%); "software and services," (14.3%); "hardware exclusively," 11.4%; and "services exclusively," 5.7%.

There was strong agreement among vendors that the manufacturing market is a viable one. Reacting to a spectrum of questions on the subject, 72.2% agreed manufacturing is a "large, unsaturated market, well worth pursuing."

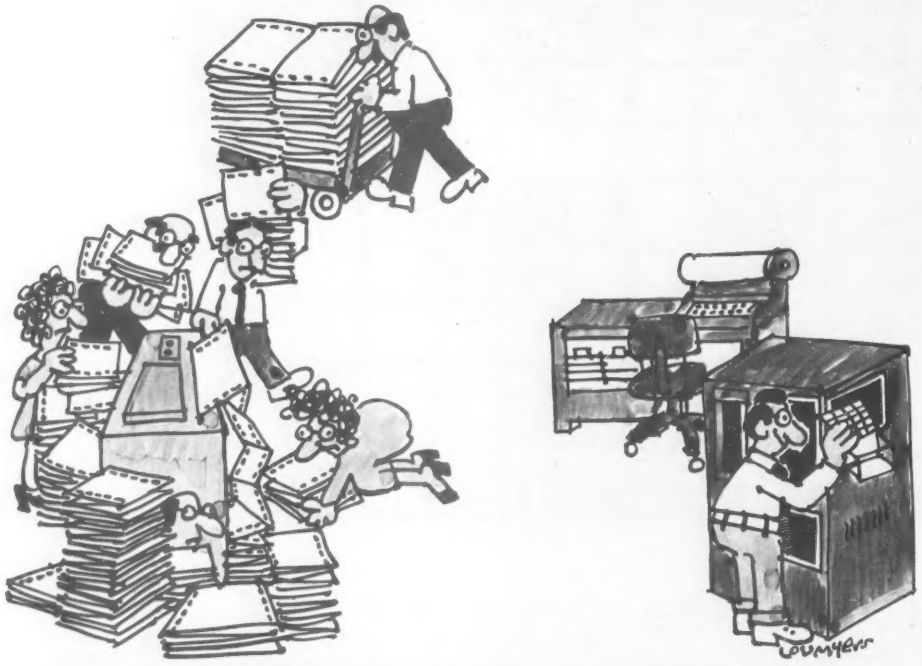
Manufacturing systems, in particular MRPs, have been very susceptible to failure. The study gave several reasons for the situation, first and foremost being the failure to obtain agreement, approval and, most importantly, commitment from top management.

Other reasons cited included failures in specifying requirements, managing people, estimating time and effort required and obtaining the most current and factual data available on the application.

On the benefit side, significant reductions in work-in-progress inventories can be achieved through computer-based manufacturing systems.

Up to 50% reduction is possible for component and raw materials inventories; 30% is frequently achieved and 10% to 20% should be readily obtainable, Infodyne noted.

The study is available for $2,500 from Infodyne at 1700 W. 78 St., Minneapolis, Minn. 55423.



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'Computerworld' Practicing What It Preaches

By Tim Scannell
CW Staff

FRAMINGHAM, Mass. — *Computerworld* has finally put into practice what it has been preaching for years — computerization.

A computer-based text-editing system officially went on-line April 1. However, eager reporters and copy editors started working with their terminals several weeks before that, while the system was being tested and installed.

So far, as the system continues to grow weekly, there have been little or no problems with user resistance here.

What made CW finally computerize? Well, basically to buy a little more time in the editorial process. Currently, CW pages are put together here in Framingham and then put on a plane bound for Chicago, where they are printed. That plane ride puts a tight squeeze on deadlines.

In a few months, when the Atex, Inc. system is fully operational, it is expected to push back a reporter's deadline by almost a full extra day. Essentially, the system will eliminate the former typesetting-proofing-correcting cycle.

Reporter/Typesetters

Reporters have effectively become the typesetters — what they type, after it is edited at the CW copy desk, goes directly to one of two Autologic, Inc. phototypesetters, where copy is output ready for printing. The Autologic machines — which are basically third-generation phototypesetters — were just recently installed and can output copy at about 1,000 line/min.

Previously, CW used second-generation Itek Corp. Pacesetter Mark I and IV typesetters that operated at around 30 line/min.

The system, which cost a total of $1.2 million (for the Atex equipment, phototypesetters and site preparation), is built around four Digital Equipment Corp. PDP-11/34 computers and currently has 58 working terminals in the editorial and classified advertising departments.

The computers have a total of 512K bytes of memory and are supplemented by four Control Data Corp. 80M-byte disk drives. The system also includes a standard magnetic tape drive which is used for archival storage of editorial copy.

All of the hardware is located in a recently constructed, glass-walled computer room that sits like an airport control tower in the middle of what was once CW's Production Department area. Production and a portion of the Typesetting Department were slightly relocated to make way for the room's raised floors, special air conditioning and Halon protection systems.

Although the computers required months of preparation as two miles of cables were snaked in and around offices, it only took about four weeks to uncrate the computers and get the text editing system on the road, according to newly appointed systems manager, Tom Pfau. Officially, the system went totally on-line the first week of April.

While CW considered a number of vendors to fill its text editing bill, only two really made it to the final wire — Atex and Composition Systems, Inc. (CSI). Actually, it was a photo finish between the two companies, but Atex was selected over CSI because its system offers word processing and the company is headquartered not far from CW.

CSI's word processing handicap could have been overcome by adding a Wang Laboratories, Inc. 10-station word processing system — which was considered during the final decisive hours. But Atex's proximity and availability, rather than its price bid, proved to be the winning hand for the firm.

To ensure that CW's computing venture was launched with a mini-

(Continued on Page 12)



CW Photo by P. Segal

CW staff writer Bruce Hoard is pictured here demonstrating the approved method of interfacing with CW's Atex text editing system.

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BDS

"IT PAYS TO HAVE THE RIGHT CONNECTIONS"

CW Finally Puts to Practice What It Preaches

(Continued from Page 11)

mum of difficulties, Atex assigned an applications specialist to customize the system to fit the paper's editorial formats and made sure that the computers accurately responded to the terminals and other peripheral devices. According to systems manager Pfau, Atex applications specialist Enzo Guadagnoli single-handedly got the text editing system up, "putting in many, many hours and evenings" working out all the hardware and software kinks.

Without the slightest hesitation, editors and staff writers retired their IBM Selectrics (to within reaching distance) and began typing copy into the system. While many writers threw caution to the printer and backed up their electronic scribblings with hard copy, others chose to put all their trust in the flickering green CRT screens. Within days, reporters adapted to the computers and accepted words like "Store" and "Execute" as a part of normal newsroom dialogue.

"People have been really psyched for it," Pfau said, during one of his now infrequent lunch breaks. "They're a young group of people and they're aware of the difficulties surrounding a new system."

The system has been accepted as a welcome tool, but it has not been without its problems — both mechanical and medical. While it has so far performed without any serious errors, it has been plagued by an occasional and annoying "floating glitch" in the CPU's multiprocessor bus (MPB).

The bus acts as "the main artery of the system" and has been acting "a little flaky" at times, Pfau noted. Mainly, the bus causes the entire system to unexpectedly "lock up," preventing writers from storing copy.

The problem with the MPB has yet to be eliminated, but Pfau has managed to get around it by bringing the system down and rebooting.

While the MPB problem hasn't resulted in any irretrievably lost copy, a number of writers have sent paragraphs into oblivion by pressing the wrong key, or forgetting to store copy before logging off the system. "I've lost a lot of good paragraphs that way," one CW writer moaned recently.

Copy Desk

Unfortunately, the people helped most by the system — those on the copy desk — are also the people experiencing the most physical problems. Since the copy editors now act as both typesetters and proofreaders as well as copy editors, it takes a little longer to edit a writer's copy, according to Catherine Marenghi, CW's chief copy editor. And several members of the copy staff have also complained of severe headaches and eyestrain, one case serious enough to merit a visit to an eye doctor.

CW is working to correct any ergonometric problems by painting over glare-producing white walls, changing the fluorescent lighting system and rearranging furniture to prevent neck or back aches. A number of people interviewed also expressed interest in eventually establishing a system of mandatory and regular eye examinations to head off any potential hazards that could evolve into serious problems.

One general problem experienced by nearly everybody on the copy deskside is the extraordinary amount of overtime put in to learn the intracacies of the system while at the same time adhering to publishing deadlines and turning out extra-large issues in preparation for the National Computer Conference. Fortunately, this problem will disappear with experience, Marenghi stated.

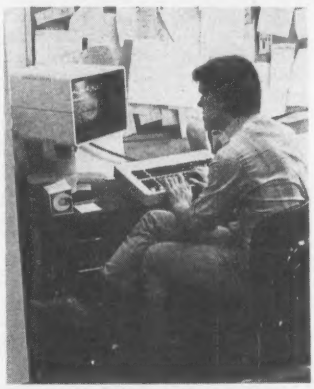
No Displacement

The remarkable thing about CW's text editing system, as opposed to that of other newspapers, is that no one has lost his job because of the computers. While the people on CW's typesetting staff will no longer have to re-key each and every writer's story into the typesetter, they will still be needed to enter submitted articles, copy sent from the newspapers three bureaus and classified ads.

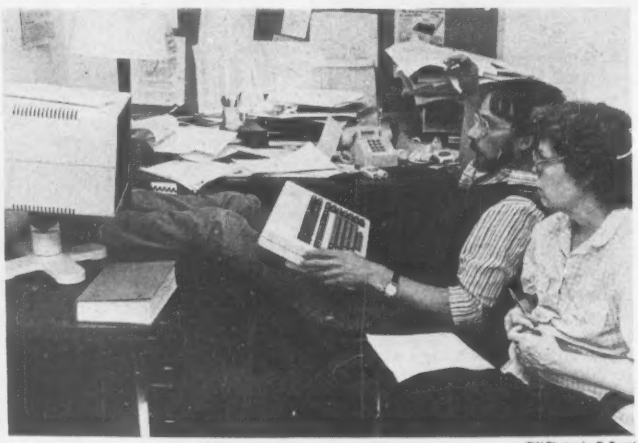
Their function will be reduced, however, when both the bureaus and the classified ad department hook up with the Atex system sometime this summer.

Rather than cut the size of the staff, or close the department entirely, production will act as a "service center" for the rest of the company, Lee Vidmer, vice-president of production, stated. In addition, many people will be absorbed into present and expanding areas in the company's structure.

As for cost savings, the Atex system will do away with the need for adding an extra person in production for every 16 pages the paper jumps in



Copy editor Steve Milmore adopts a more casual, relaxed manner as he edits Hoard's story.



CW Photos by P. Segal

Copy editors Donovan White and Barbara Van Scoyoc maintain a respectful distance while preparing the story for the typesetter.

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Boston	WXNE	25	Wed.	10:30 PM
Washington, DC	WDCA	20	Saturday	12:00 Mid.
Philadelphia	WTAF	29	Monday	10:30 PM
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By Installing Computerized Text-Editing System

size, Vidmer continued. This is an important point considering that in the past three years, CW has grown from about 84 pages to an average size of 152 pages per week.

While reporters and editors busily use the system to report on the fast-moving computer world, plans are already being laid to bring the classified ad department into the on-line fold — probably sometime this June, according to classified ad manager, Bill Mills.

"We're trying to bring the Atex system as close to what we're now doing manually as possible," Mills said. "That way, people will be basically doing the same things, but through the Atex system."

As a part building the system's classified arm, Atex has already installed a Harris Corp. 2200 graphics ad display terminal which will allow staffers to lay out classified ads on the unit's CRT screen and make changes interactively. Basically, this will allow more time to work on an ad's graphic quality and hopefully result in better graphic reproductions for CW advertisers.

The system will also be able to produce instant quotes on ad rates, do credit checks, and generally result in a shorter turnaround time, Mills continued.

In general, "The Atex system will dramatically change how we handle a customer," he added, noting that it will probably make CW's classified department the best and most responsive of all trade publications.

Page Makeup

Currently, Atex is working on the logistics of adding an automated page makeup capability to the expandable text editing system sometime within the next few weeks. A "soft" phototypeseter has already been installed which acts as a previewer for final copy that is sent to the hard typesetting system.

The way this system will work is that people on the copy desk will inject certain coding into a writer's story that will give some indication of where that story will apppear in the paper. Using this code, the soft typesetter will make the story take the shape of the "news hole," that portion of a page set aside for editorial material.

In effect, the automated page makeup system will do away with the old "cut and paste" method used previously by CW to piece together its weekly news package.

Looking to the future, the newspaper hopes to bring its New York, Washington, D.C., and California bureaus into the electronic fold by installing remote terminals this summer. Communications with the bureaus, however, will be asynchronous, or one-way, and reporters there will not be able to review stories by pulling them back from the central computer.

Another down-the-road possibility is the addition of portable terminals that could be carried on out-of-town assignments. This would eliminate the need for reporters to search out well-hidden telegraph offices in the dead of night and in particularly seedy parts of a city to send back copy for the next morning. Articles could be filed from the comfort and safety of a hotel room.

Eventually, CW wants to add an on-line archiving system to the text-editing computers so that reporters could have instant access to past articles. This move would probably require a fifth CPU and at least another tape drive, Pfau noted.

Presently, stories are dumped to tape on a weekly basis and filed off-line.



CW Photo by P. Segal

Chief copy editor Catherine Marenghi turns to hard-copy output of story files to place the story.

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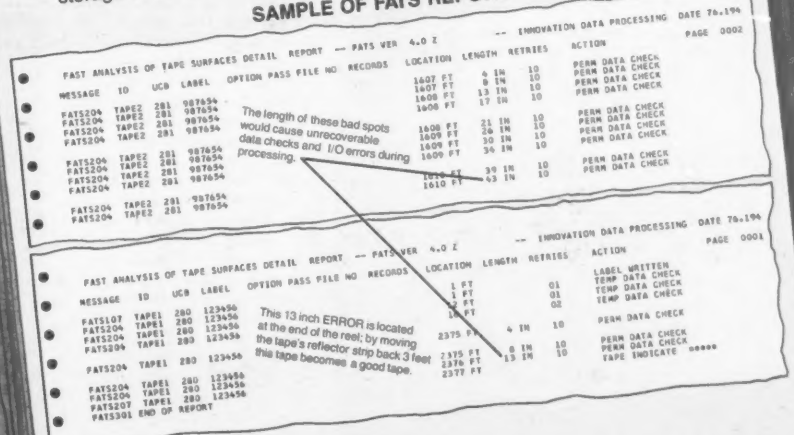
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Info Technology Called Threat to Dictators

By Brad Schultz
CW Staff

WALTHAM, Mass. — Information technologies will cause the fall of Middle East sheikdoms and other autocratic regimes in the next decade, according to a management professor who advises the U.S. State Department and foreign corporations on strategic planning.

Speaking at Bentley College's recent Fourth National Business Ethics Conference here, Dartmouth College Prof. James Brian Quinn declared that "no country with an autocratic government is likely to survive the present decade" because technologies that rapidly convey information lead to redistribution of wealth and political power.

This conclusion by a longtime adviser to high-ranking government officials builds on the notion that a little knowledge can be a dangerous thing.

Even in relatively poor countries under totalitarian rule, Quinn explained, computer technology is spreading among the masses, allowing people to clandestinely receive, store and manipulate data that may suggest ways to work for greater liberty and improved economic conditions.

Quinn was a member of the U.S. Delegation on Management and Technology Transfer to the People's Republic of China and recently chaired the President's Domestic Policy Review Group on Productivity and Innovation.

He has advised Congress, the President's Cabinet and the government of Norway on how technology changes the process of planning for the future.

Innovations in computing will shift people from information retrieval to knowledge retrieval systems, Quinn said.

A more informed society, he indicated, is likely to push for social and political reforms as it realizes that unpleasant conditions of the present can be changed.

However, information technologies tend to replace old elites with new ones, Quinn noted.

Tracking Corporate Fortunes

By Brad Schultz
CW Staff

WALTHAM, Mass. — Computer technology will allow corporate planners in coming years to anticipate the results of alternative business strategies, an economist told Bentley College's business ethics conference.

Dr. Sidney Schoeffler told the conference how computers at The Strategic Planning Institute in Cambridge, Mass., track the fortunes of many kinds of companies so clients in the present can learn from what similar companies experienced in the past.

Formerly General Electric Co.'s strategic planning director, Schoeffler founded the institute in 1975 and serves as its executive secretary.

The institute's data bases allow a client company to evaluate a proposed market strategy by discovering how, under comparable conditions, similar companies have fared with similar strategies, Schoeffler explained.

The author of *The Failures of Economics* told the conference that this sort of computer-assisted research could greatly benefit the nation's economy because it allows corporate planners to try out new ideas without risking much capital.

Regarding business ethics, such applications of computer technology could allow companies to act more ethically since the consequences of actions would be more obvious.

"You cannot act ethically if you're oblivious to the consequences of your actions," Schoeffler observed.

However, Prof. Jeffrey A. Meldman of MIT's Sloan School of Management told the conference that the planning approach advocated by Schoeffler seemed to quantify "things that are difficult to quantify — that may be unquantifiable by nature."

Schoeffler countered, "Nothing cannot be reduced to data"; to which Meldman replied, "But is that [reduction] desirable?"

A graduate of Harvard Law School with a Ph.D in computer science from MIT, Meldman suggested that some aspects of strategic planning are better addressed in qualitative rather than quantitative terms, especially where ethics are concerned.

Series to Cover Integrated Way To Management

SUNNYVALE, Calif. — A series of two-day forums on an integrated approach to capacity management will be presented in May and June by the Educational Services Division of Boole & Babbage, Inc., a software company based here.

The forums, designed for DP directors, managers and staff members involved with DP centers, will cover such topics as the DP work plan, the capacity management environment, characterizing and projecting workloads and software methods of integrating the process.

Registration costs $495, with group discounts available. Dates and locations are: Chicago, May 18-19; New York, June 1-2; Dallas, June 15-16; and Los Angeles, June 24-25.

More information is available from Claudia Heyman, Boole & Babbage, Inc., 510 Oakmead Parkway, Sunnyvale, Calif. 94086.









Regulated or Not

Health-Care Systems Called Recession-Proof

By Rita Shoor
CW Staff

CAMBRIDGE, Mass. — Government regulations may come and go for health-care systems, but "the effect [of regulatory changes] on computer systems will be zero," according to Prof. Regina Herzlinger of the Harvard Business School.

"DP is a recession-proof industry," maintained the director of the control area over the business school's financial, cost accounting and computer systems. And although she speculated that deregulation may become the order of the day in health care, she added that "the paperwork probably won't diminish . . . It may even increase." And more paperwork suggests more complex computerized information systems to deal with it.

Government regulations and their cost to the U.S. health-care industry are a special area of interest for Herzlinger, a control specialist who worked for several management consulting firms before joining Harvard. She recently spoke on this topic before the Electronic Computing Health-Oriented (Echo) IBM user's group in Nashville, Tenn. Echo is composed of physicians, administrators and others who are involved with health-care systems that run on IBM equipment.

"I don't know of any [organization] that has done a careful study" of how much specific regulations have cost private industry in terms of health-care systems, she obs. ved. But she indicated that the regulatory price tag was substantial.

Capital Regulation

Three primary types of regulations affect health-care systems, according to Herzlinger. The first involves capital regulation. Every time a health-care organization plans a capital expansion involving an investment of more than $100,000, the organization must receive approval from a government agency, a regulation that has been in effect since the early '70s, she recalled. It was originally implemented to stop duplication of effort within the health-care industry.

While this intention was admirable, there is "no evidence that it [capital regulation] avoids duplication," she said. However, there is "clear evidence" that the regulation does, in fact, make health-care proposals more expensive. The rate of inflation in health care is higher than in most other industries, Herzlinger explained, so the delay involved in processing these proposals through a regulatory agency makes the proposal significantly more expensive if it is approved.

The control specialist cited an instance of a $40 million proposal that took more than four years to review in Massachusetts. By the time the organization received its Certificate of Need, the cost of the proposal had escalated to some $60 million, she said.

Computer equipment often exceeds the $100,000 limit, she pointed out. Computerized axial tomography (CAT) scanners are a typical example. Each CAT scan unit costs about $250,000. And while equipment manufacturers will help organizations avoid the regulation by unbundling a unit and selling individual elements for less than $100,000, Herzlinger indicated that this unbundling was "not necessarily a good response to this legislation."

PSRO Review

A second regulatory process that doesn't appear to be having a desired effect is the utilization review conducted in health-care organizations by professional standards reviewing organizations (PSRO). The PSROs are composed of physicians and medical professionals who review hospital records to determine the quality of care and length of stay of particular patients.

This peer review process requires maintaining "lots of records" within the hospital's DP system, since a large amount of information is often necessary in order to justify a given patient's time in the hospital, Herzlinger said. At least partially due to the high cost of this computerized recordkeeping, a recent Congressional Budget Office study concluded that PSROs cost 20% more than they save, she said.

The third main type of health-care regulation involves setting hospital rates prospectively rather than retrospectively. Six states, including Massachusetts and New York, now set rates prospectively; the remaining 44 are paid retrospectively. Again, the intent of the regulation — to put a cap on the rate of increase in hospital costs — seems laudatory, and it seems to have worked to some degree.

For example, the six states with prospective rate setting had an 11% average rate of increase per year per admission, Herzlinger said; the other 44 states averaged a 14.3% increase per year per admission.

The problem is that prospective rate setting is driving some hospitals into bankruptcy. Some 40 out of 220 hospitals in New York have gone bankrupt since that state implemented prospective rate setting, she pointed out, and many of those were in ghetto or rural areas. This type of regulation is obviously "harsh in effect."

It also can involve a large amount of data collection and analysis in order to set the rate correctly, according to Robert Gibson, director of systems development at Vanderbilt University Medical Center. "Most billing systems aren't set up to do this," he said.

Data Collection

Therefore, the data collection involves either "significant manual overhead" or creating a data base containing information relative to the case mix of the hospital and the costs of a given service at that institution, he explained.

Since these "regulatory strategies have not been particularly effective," Herzlinger predicted the emergence of a trend towards deregulation in health care.

President Reagan's administration is currently working up a proposal to eliminate the PSRO program — a proposal that is running into strong opposition from some doctors' groups, according to a recent *New York Times* article. In contrast to Herzlinger's opinion, these groups think that medical-care costs will soar even higher without the PSROs.

The Harvard professor also mentioned a government proposal that would offer employers a choice of group insurance plans for employees. The employer would pay a flat fee and the employee would choose the type of plan he wanted with the understanding that he would pay the difference between the bill and the employer's previously agreed-upon payment.

This might encourage employees who opted for the plan offering less coverage to use health-maintenance organizations (HMO). And HMOs mean 20% to 40% decreases in hospital rates, Herzlinger said.

Regardless of which proposals are finally implemented, computer systems developers needn't worry. The federal government will want to monitor the effect of any new proposal and the recordkeeping that results from this may even mean an increase in health-care related computer systems, Herzlinger concluded.

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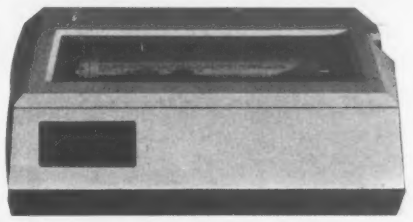
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Immediate Delivery

User Finds Microcode Assist Hikes M80/31 Throughput 15%

By Rita Shoor
CW Staff

SAN JOSE, Calif. — Source 2 International, Inc. raised system throughput "10% to 15%" by adding a microcode-assist feature to its Magnuson Computer Systems, Inc. M80/31 computer.

The change was measured in a benchmark conducted by Source 2's technical staff that compared performance of an inventory cross-reference system both with and without Magnuson's firmware. Each benchmark run consumed approximately 2½ hours and results were confirmed with IBM's System Measurement Facility statistics, according to Kirk Jensen, Source 2 cofounder and vice-president.

Introduced last year [CW, Oct. 27], the feature replaces frequently used routines in Cullinane Database Systems, Inc.'s Integrated Data Management System (IDMS) with some additions to the 370 instruction set, a spokesman explained. It was developed by Magnuson with technical information provided by Cullinane technicians.

Heavy Use

The international electronic component exchange is a "heavy IDMS" user under an OS/VS1 operating system with about 50% of its CPU cycle time in IDMS mode, he said. Its on-line real-time system combines CICS with IDMS, processes more than 10,000 transactions each day and stores more than 2M bytes in its data base.

"Magnuson's assist virtually eliminated long response times for our system," Jensen said. "It provides a major boost to Cullinane's data base package."

The microcode's advantages become especially apparent in a multiuser interactive environment like Source 2's, the vice-president noted. It helps with the data interlock problem that occurs in on-line systems when multiple users try to update the same record simultaneously and wind up in a "deadly embrace," he said. So, "the more users in a system, the more the [Magnuson] feature helps."

Source 2 installed the computer in October, 1980 and brought up IDMS during the same week, he recalled. Price, performance and reliability advantages were the reasons Jensen gave for choosing the M80/31 over IBM's 4341 Model 1. "We simply can't afford much downtime in our type of business," he said, and "we've had less than one-half hour of downtime in six months."

MVS Users Organize Group

IRVINE, Calif. — Smith Tool Co. here has organized an IBM MVS Users Group for Orange County to promote the free exchange of information between technical support staffs in neighboring facilities.

The group's April meeting will feature a talk by Marty Sprinzen of Candle Corp. on an analysis of MVS/SP3.

Organizations interested in joining the new group and participating in the upcoming meeting can receive more information from Wayne Meriwether, Orange County MVS Users Group, Smith Tool Co., P.O. Box C-19511, 17871 Von Karman Ave., Irvine, Calif. 92713.

Full PUC Hearings Set For Southwestern Bell EIS

By Marguerite Zientara
CW Staff

AUSTIN, Texas — The Texas Daily Newspaper Association (TDNA) has won its fight for full public hearings on the question of Southwestern Bell's foray into a Yellow Pages-type electronic information service (EIS) that was originally slated to begin here this summer [CW, Dec. 15].

In a prehearing of the state Public Utilities Commission (PUC) last week, it was decided that full hearings should begin July 6, a month after the experimental project was to have begun. Meanwhile, the utility's preparations for EIS have been halted following an adverse court ruling, now under appeal [CW, April 13].

Cutting Edge

The test is considered nationally significant because EIS is on the cutting edge of AT&T's thrust into the on-line services business. Through dial-up telephone circuits, EIS would provide interactive information services to homes and businesses through standard TV sets and/or low-cost telephone/CRT terminals.

Besides having access to telephone directory services and teleshopping capabilities, users would be able to store personal information in an on-line central data base.

TDNA, together with Datapoint Corp., persuaded PUC several weeks ago to bar the phone company from proceeding with the test until PUC had considered the two groups' objections.

Those objections lay in the argument that the test is illegal until and unless Bell obtains permission from the Federal Communications Commission.

Southwestern Bell then took PUC to a state district court, which ruled in PUC's favor. Bell consequently requested the Texas appeals court here to consider the lower court's ruling. That appeal will be heard in June.

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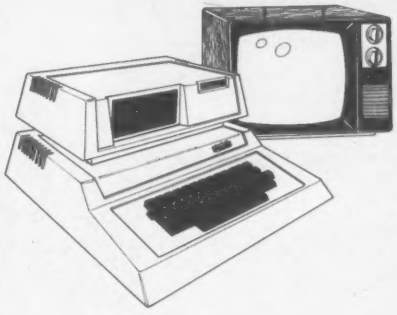


Now you can.

Ohio Scientific's IBS-NET™ provides distributed processing at microsystem prices.

Ohio Scientific's new Iniegrated Business System Network brings the benefits of distributed processing and advanced data communications to the smallest and most cost conscious business applications. In its fully implemented form, it can provide "office of the future" capabilities to small businesses, branch offices and departments of larger companies which rival the most exotic mini and mainframe based systems.

IBS-NET™ places small economical state-of-the-art processors at each user's work station. Several work stations are clustered around a data base processor which provides large fast access file storage and sharable resources such as word processing printers and remote communications channels. Several clusters can be networked together and/or tied to existing computer facilities. Local communications are handled by low cost, high speed cable links and remote communications can be handled by a broad range of M/A-COM communications technologies including cable, fiber, microwave and Dynac two-way satellite earth stations.



End User Benefits

Using standard IBS-NET™ hardware and software, a small to medium sized office can be equipped with personalized work stations which have the following capabilities:

- Distributed Word Processing
- Electronic Mail
- Modeling and Financial Planning
- General Information Retrieval
- Accounting including AR/AP, GL and Payroll
- Order Entry and Inventory
- Remote Data Access
- Stand Alone Operation Capability

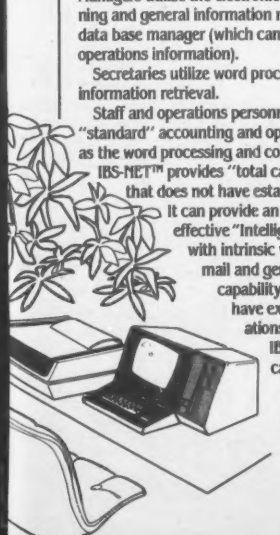
Managers utilize the electronic mail, modeling and planning and general information retrieval features of the data base manager (which can access accounting and operations information).

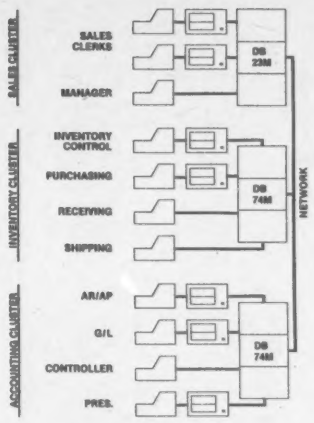
Secretaries utilize word processing, electronic mail and information retrieval.

Staff and operations personnel make use of the "standard" accounting and operations modules as well as the word processing and communications features.

IBS-NET™ provides "total capability" to the small office that does not have established EDP capability. It can provide an extremely capable and cost effective "Intelligent terminal front end" with intrinsic word processing, electronic mail and general data communications capability to larger companies which have existing accounting and operations computer capability.

IBS-NET's™ local small office capabilities married with M/A-COM's data communications expertise can yield extremely effective results for branch offices of larger corporations.

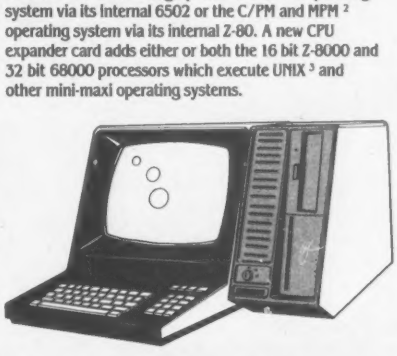




Versatility & Expandability

Work stations — Ohio Scientific offers a broad range of work stations ranging from ultra low cost "personal type" desk top computers through several medium priced integrated intelligent terminal models to a 32 bit processor based system with a local 5" hard disk.

Data Bases — Ohio Scientific's popular field-proven Challenger hard disk computers with 14" Winchester hard disks are the "core" of the data bases. Current models provide 37 or 74 megabytes of usable data base storage. Hard disk backup is via the network and/or tape cartridge or IBM compatible 1600 BPI mag tape [1]. The Challenger's unique multi-microcomputer architecture allows it to run Ohio Scientific's ultra high performance 65U operating system via its internal 6502 or the C/PM and MPM [2] operating system via its internal Z-80. A new CPU expander card adds either or both the 16 bit Z-8000 and 32 bit 68000 processors which execute UNIX [3] and other mini-maxi operating systems.



Upward Expandability

Up to 16 work stations can be clustered around a central data base and several data bases can be connected locally, all using very inexpensive high speed cable links. Remote links via several protocols give the system virtually unlimited interconnect capability.

Downward Compatibility

Realizing that first time computer users may be hesitant to go all the way to the "office of the future" in one step, Ohio Scientific has paid careful attention to the migration path from single user to network configurations.

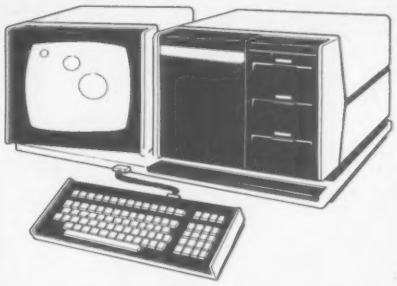
All work stations are available as stand-alone desk top or single user small business systems.

The network data bases are currently very popular as single user and Timeshare systems with up to 16 dumb terminals. Ohio Scientific even offers a "converter" which economically adds intelligence to those dumb terminals when the system is upgraded. The end user can start with a small single user system, later add timesharing and ultimately networking.

Software

The base operating system which provides the highest through-put is OS-65U, which is upward compatible from single user to timeshare to networking. OS-DMS-PLUS is the system's turnkey data base manager with optional network compatible modules including a word processor, DMS-Planner, an electronic mail system and a full set of basic accounting and operations modules including A/R-A/P, GL, Payroll, order entry and inventory. DMS-PLUS includes general entry, editing, arithmetic and report writing capabilities. It is compatible with Microsoft BASIC making it powerful and simple to use for software expansion and enhancement.

Suitably equipped work stations and data bases can also run C/PM (single user) and MPM [2] (multiuser), a popular microcomputer operating system, and Microsoft's XENIX [4] operating system for the Z-8000 which is a UNIX [3] compatible operating system enhanced for business applications.



Real? Or Futures?

Ohio Scientific has delivered hundreds of OS-65U Level 3 local networks in the last 2 years and tens of thousands of desk top, single user and hard disk based computers over the last 6 years.

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(1) Tape backup units are available from Alloy Engineering.
(2) C/PM and MPM are registered trademarks of Digital Research.
(3) UNIX is a registered trademark of Bell Laboratories.
(4) XENIX is a registered trademark of Microsoft.

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Urbis Study Identifies Four Historical Stages in

By Brad Schultz
CW Staff

IRVINE, Calif. — The Urban Information Systems (Urbis) Research Group here has identified four historical stages in the evolution of local government computing. They are:

- Introduction and Conquest.
- Experimentation and Expansion.
- Competition and Regulation.
- Reassessment and Consolidation.

This model for the history of local government computing arose from the Urbis investigation of DP at 42 U.S. cities, the most exhaustive study of its kind yet performed.

The first stage, Introduction and Conquest, began during the 1950s among the larger American cities and counties, the Public Policy Research Organization (PPRO) team noted in the forthcoming *Computers and Politics*. The chief policy concern then was whether to adopt the technology and, if so, where to fit computing in a local government.

Policymakers wrestled with issues such as how to use computers, whether computing should serve all of government, whether it should be organized as a support service, who should control it, who should manage it and how to finance it.

Eventually, discussion centered on whom computing would serve, Urbis said. What calculating and sorting devices agencies already had were decentralized. Departments with large-volume DP operations such as utility billing, tax billing, voter registration and traffic ticket processing had implemented electrical accounting machines (EAM) and other forerunners of the computer.

"The high costs of early computers dictated that there be only one centralized computer installation in the government," Urbis stated, "and that it replace the previously decentralized EAM installations in order to be cost-effective."

Finance Automated First

The expense and centralizing effect of the computer during the Introduction and Conquest stage led local governments to give chief executive officers — mayors and city managers — responsibility for systems acquisitions and allocations, Urbis pointed out. But finance department chiefs typically pushed hardest for automation in the nation's cities and counties.

Already the city's largest EAM user, finance chiefs, supported by enterprising vendor salesmen, convinced many a mayor that computers would replace armies of clerks and form a support service, like finance. Mayors thought they were getting "glorified accounting machines."

The finance department, therefore, kept the keys to the city's first computer. The finance chief marked billing, accounting and budgeting applications as easiest to computerize and having greatest potential for improvement.

Other city departments lost their EAMs and funding that had subsidized them, while the finance departments were made dependent. As computing shifted resources from other departments to finance, few among the former users anticipated the broader political consequences of implementation, Urbis emphasized.

This first stage of local government computing coincided with a push for financial reforms in cities and counties. The movement called for improved methods of cost accounting and centralization of support services.

During Introduction and Conquest, the finance director gained influence over other local government departments. Moreover, data processing was centralized and the dynamic technology of computing was justified as a tool of government officials.

The second stage in the evolution of local government computing, Experimentation and Expansion, began in the mid-1960s, Urbis declared, when the finance department was advantaged over other departments in number of

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lution character cells to give you a sharp, clear picture. Some models have line drawing modules that make it easy to design familiar forms on the screen; soft keys that you can define yourself for repetitive tasks or easy access to a wide range of functions; and local mass storage to turn your terminal into a true local workstation. Even international character sets are available.

42005

Evolution of Local Government Computing

applications developed and redeveloped.

The central issue of Experimentation and Expansion was how to distribute the benefits of computing among government departments. At this time, second-generation computers with larger capacities for data storage became available.

Also, the federal and state governments became interested in subsidizing experimental applications of computing at cities and counties. The range of applications widened, and journals like *Computerworld* began publicizing them.

Gradually, computing decentralized as departments other than finance found they wanted and could afford the new class of mainframes. The local government's top management thus had to delegate responsibilities for DP decisionmaking, and user departments assembled staffs of technical experts under long-range master plans.

This is the sixth article in a seven-part series on how computing affects local government. The series is based on soon-to-be-published research conducted by the Public Policy Research Organization's Urban Information Systems Research Group.

Through this second historical stage, finance generally dominated local government computing, but other departments began challenging its authority and the political aspects of computing became obvious. Further, users within the government began scrambling for control over information resources, not just computer resources, so that access to data banks became a precondition of political clout.

The third stage, Competition and Regulation, began in the late 1960s and early 1970s when professional planners, analysts and managers within the local government began to regularly wield computer-stored data as a political tool.

This "information elite" had high demand for computing, and local government departments developed "an endless desire for new or modified applications," Urbis said. In contrast to the second stage, when computing resources seemed unlimited, Competition and Regulation was a period when city and county users fought for limited resources on the pretext that extended computing would make decisionmaking more rational and fill genuine "needs."

During the third stage, federal money was showered on police departments for a "war on crime" and police computing grew to equal or surpass finance computing in many local governments," Urbis stated.

The gap between "haves" and "have-nots" in local government computing widened, generating efforts to establish regulatory mechanisms. Besides moderating the scramble for DP resources, regulatory bodies looked into cases of major systems failures, computer abuse and procurements-quabbles.

For the first time since the

(Continued on Page 22)

Articles in this series on local government computing summarize portions of Computers and Politics, *a book by James N. Danziger, William H. Dutton, Rob Kling and Kenneth L. Kraemer to be published by Columbia University Press, 526 W. 113 St., New York, N.Y. 10025.*

Computers and Politics *is the second book from the Public Policy Research Organization's (PPRO) Urban Information Systems (Urbis) Research Group based on the Urbis study of DP at 42 U.S. cities. The first book,* The Management of Information Systems *by Kraemer, Dutton and Alana Northrop, was published by Columbia University Press this year.*

PPRO is an institute of the University of California at Irvine. For more information on Urbis projects, contact Kraemer c/o PPRO, University of California, Irvine, Calif. 92717.

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Further Delays Expected

OMB Asks Cost Analysis of Nine-Digit Zip

By Bill Laberis
CW Staff

WASHINGTON, D.C. — In what may be a portent of even stormier seas ahead, the federal Office of Management and Budget (OMB) has asked the U.S. Postal Service (USPS) to compile a user cost and benefit analysis for its proposed nine-digit Zip Code.

A spokesman for the USPS said Postmaster General William Bolger has not decided whether to comply with the OMB request, or whether compliance would further delay the planned June 1 start-up of the new system, originally scheduled to commence operations last month.

Honored or not, the request is certain to further complicate efforts to get the proposed $900-million computerized system up and running, in view of congressional opposition that has mounted since the first of the year. The Senate is presently mulling a bill introduced in February by Sen. David Durenberger (R-Minn.) enjoining the USPS from spending any money on a nine-digit Zip Code.

"The Postal Service has figured out the costs of the system to itself, but we haven't seen what the impact is going to be on the private sector and on the federal government," according to Bobbi Hersch of Durenberger's office. Durenberger is the chairman of the Senate Inter-Governmental Relations subcommittee.

"Besides, we believe that the savings they predict for themselves make too many assumptions of what the private sector's big volume mailers will do and how they will react to the system," she added.

The proposed system, targeted at the large-scale mailers, would be a voluntary one phased in over six years in two parts. If it catches on the way the USPS thinks it will, the savings to both USPS and users would be substantial, according to figures supplied by USPS spokesman Robert A. Becker.

Over the next three years, the USPS would spend $316 million on optical bar-code and character readers, while making other modifications to existing equipment.

If at the end of 1984 the system gains widespread acceptance, the USPS would invest another $570 million in more of the same equipment. Becker claimed the return on the approximately $900 million investment with full implementation of the nine-digit Zip Code would be a healthy 48% to the USPS, or about $600 million a year after 1987.

The big "if" is how the large-scale private and public-sector mailers will react to the incentives.

Becker said businesses mailing at least 500 first-class letters at a time and printing the nine-digit Zip Codes in machine-readable form will receive a .5-cent discount per letter. This discount would be on top of a three cents per letter discount already allowed users who presort their mail.

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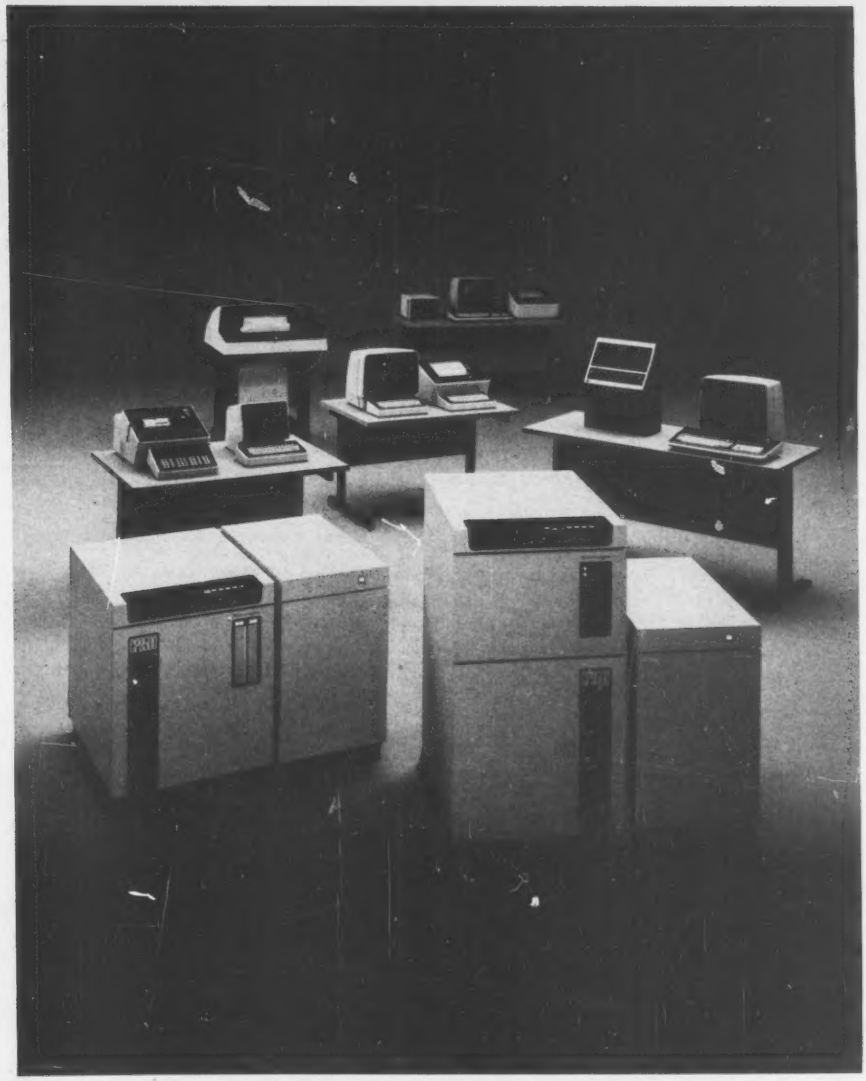
(Continued from Page 21)

earliest days of local government computing, top administrators concerned themselves with such problems.

They also braced for an anticipated takeover by the rising "information elite," but the junta failed to materialize, Urbis noted, largely because this class of planners, analysts and managers could not keep up with the rapidly changing technology and used it too much to fight each other.

Finally, the present state, Reassessment and Consolidation, began in the mid-1970s. The central issue nowadays is redistribution of computing resources, Urbis said.

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Burroughs

Managers on the Move

THEODORE PEARSON has been named data processing director for the New York Property Insurance Underwriting Association in New York City. He will be responsible for maintaining the association's computer operations and for developing new data processing applications.

Pearson formerly worked for Marsh & McLennan, Inc. where for the past six years he served as an accounting systems project manager, operations manager and most recently as project manager responsible for the development of a brokerage operations and accounting system.

Pearson obtained a B.S. in engineering from George Washington University. He serves as a director on the executive board of the New York Chapter of the Data Processing Management Association.

•••

WILLIAM N. HARRIS has been named director of management information services at the Kendall Co., a manufacturer of hospital supplies and specialty industrial products. He will be responsible for all systems and data processing operations.

Harris was most recently director of information services for Hammermill Paper Co. Prior to that, he served as manager of management advisory services for Price Waterhouse & Co. and had worked in systems and data processing for Sears, Roebuck & Co. and CNA.

Harris earned a B.S. degree from Cornell University, a B.B.A. degree from Boston University and an M.B.A. from Northwestern University.

•••

JENS P. CHRISTENSEN has been appointed an assistant vice-president of The Continental Corp. Based at the Continental Data Center in Neptune, N.J., Christensen is responsible for data processing systems and technical support services to client purchasers of insurance-related services.

Christensen joined Continental's DP operations in 1970 after 15 years of systems experience. He served in various supervisory positions and was named manager of the Sales and Customer Support Department in 1979.

He is past national secretary of the Society of Certified Data Processors.

•••

JOHN M. HAMMITT has been named director of information management at Mortonnorwich and PERRY R. GRACE has been appointed director of administration and management services for the Chicago company, which manufactures and sells salt, pharmaceutical, household and specialty chemical products.

Prior to joining Mortonnorwich in 1970, Hammitt held several research, engineering and data processing responsibilities with CPC International. He most recently was manager of corporate information services at Mortonnorwich.

Grace, former director of management information services at Mortonnorwich, previously served as director of information services for Schering-Plough Corp. Prior to that, he held several positions in sales, marketing and sales management with IBM over a period of 12 years.

•••

GEORGE F. ADAM has been appointed director of information services at Travenol Laboratories, Inc. in Deerfield, Ill.

Prior to joining Travenol, Adam was assistant director for systems development at FMC Corp. He also held po-

He also held positions as director of computer systems for Litton Industries, Inc. and national account manager at IBM.

Adam has a B.S. degree from the U.S. Military Academy and an M.B.A. degree from Golden Gate University.

•••

ROBERT L. M. LANDENBERG has been appointed vice-president of management information systems at Omni Exploration, Inc., an oil and gas exploration company headquartered in Radnor, Pa.

Landenberg was manager of corporate programming and a systems programmer for Kewanee Industries, Inc. prior to joining Omni in 1978.

Landenberg is a member of the Data Processing Management Association, the Society of Certified Data Processors and the Association for Computing Machinery.

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Are Present Salary Levels Equitable?

Turnaround Time
By Larry E. Long

Long is a professor at Lehigh University, a DP consultant and author.

Have a question? Send it to Larry Long, Editorial Department, Computerworld, Box 880, Framingham, Mass. 01701.

Q Assuming a recent DP salary survey is accurate, our salaries are on a par with industry averages. My question is, are these salaries an accurate reflection of what DPers should be earning?

As a systems manager, my group provides services to every division in the company. User managers with approximately the same number of subordinates earn from 30% to 60% more than I, but their responsibilities are much more limited. Another interesting statistic is that my staff has a higher number of years of education than any similarly sized group in engineering or accounting.

Greater responsibility over more highly skilled people results in a lower salary. It just doesn't pan out.

A Existing DP salary levels are artificially low and there is no quick solution.

The primary obstacle is corporate recognition of the scope of DP responsibilities. We are witnessing a slow but deliberate acceptance of DP as a separate and equal entity to the traditional functional areas. Equality in salaries will follow.

Q I'm the director of the data processing department of a $150 million light manufacturing firm. Sometimes I feel that we have an identity problem. People refer to us as IBM (although we've had Honeywell, Inc. equipment for five years), data processing, DP, and a few unmentionables.

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Q Can you provide some guidelines for estimating memory and disk storage requirements during the systems analysis phase of a project?

A Because of the numerous system design alternatives and optional hardware features, specific guidelines for a particular application system would not only be difficult to develop, but cumbersome to use. Identification of the considerations that affect the storage requirements is the key to making good estimates.

The following are considerations for disk space storage estimation: types and number of files (master, transaction, temporary, data base), file size and desired overflow area, on-line vs. batch, virtual memory requirements, systems and applications software (use historical data), average record length (for variable-length records) for each file, records per track, type of file organization, need for standby backup devices, frequency of file reorganization and fixed or interchangeable disks.

Although memory is much more difficult to estimate, it is usually not as critical because add-on memory units are more easily installed than disk drives. Considerations are: resident application and systems software, type and number of partitions, virtual mode, required response time and/or turnaround time, buffer areas, on-line vs. batch and production scheduling requirements.

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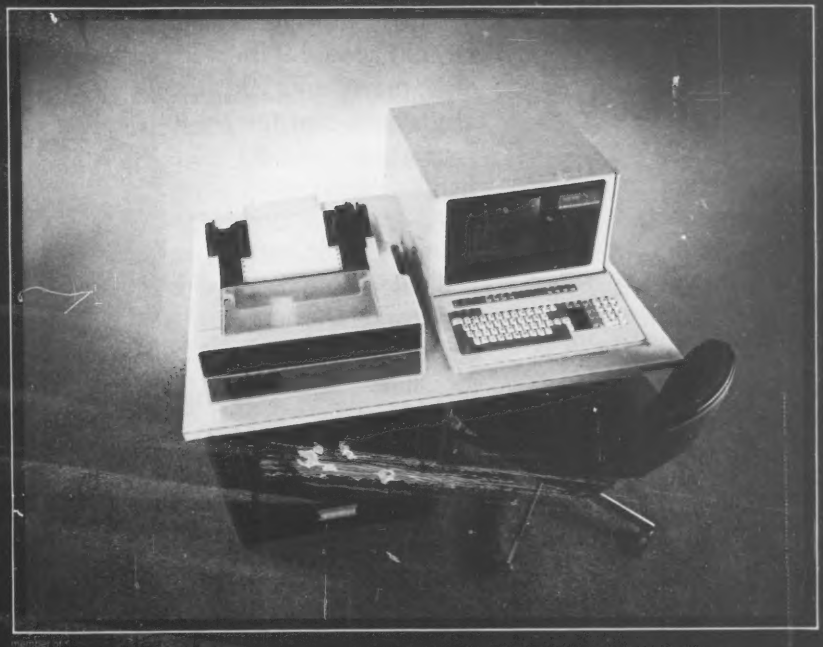
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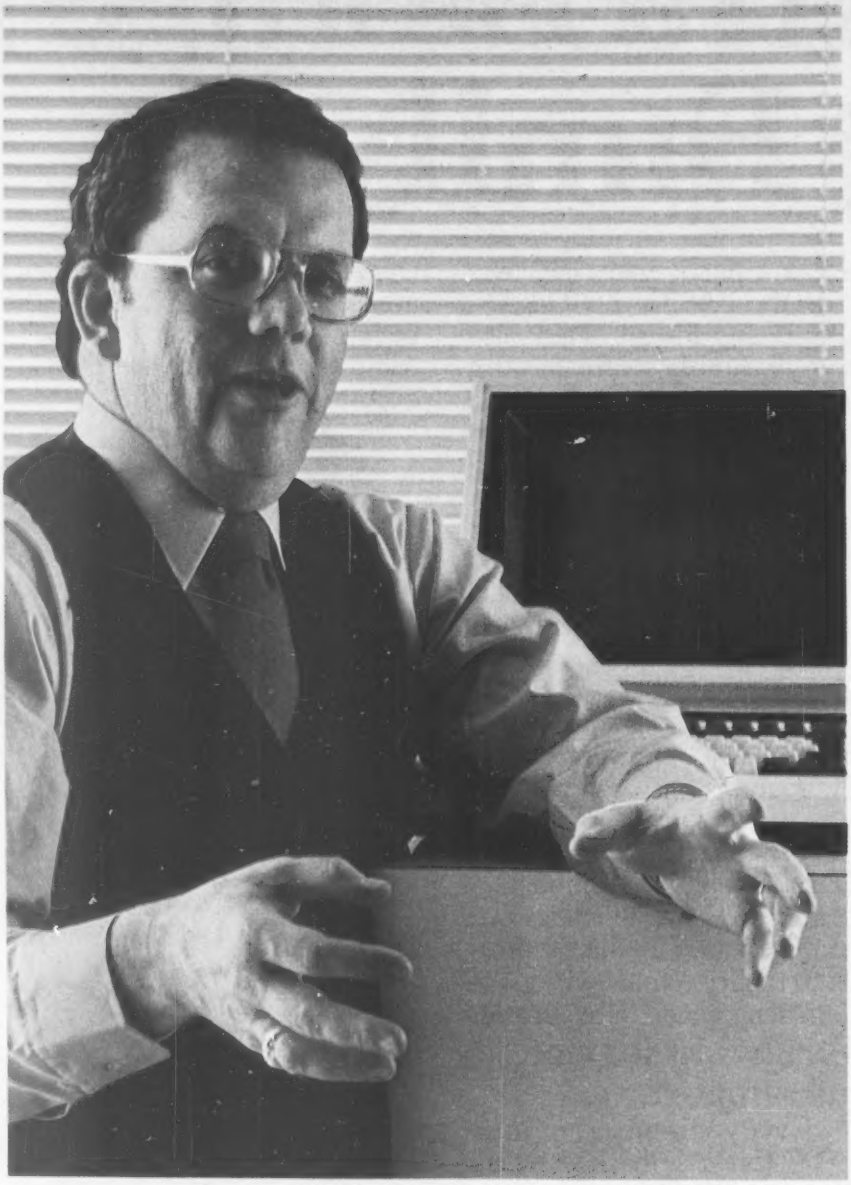
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Triumph Over Government-as-Usual

Brooks: Paperwork Reduction Act 'Big Victory'

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Jack Brooks loves a good fight — especially if he wins it.

And to hear the veteran Texas Democrat, chairman of the House Government Operations Committee, tell it recently in his keynote address to the Federal DP Expo here, passage of his Paperwork Reduction Act last year was a major victory over the forces of government-as-usual — the backsliding, bureaucratic minions of the recalcitrant, cantankerous agencies that have resisted for 15 years the reforms to government DP procurement and use mandated in his earlier law, the 1965 Brooks Act.

Brooks said he has pursued the cause of better federal DP management for these 15 years because of "an unshakable belief in the benefits" of data processing in promoting agency missions. He has persisted despite the "unbelievable" fight-to-the-death attitude agencies have toward management reform.

All and all, he said of the battle, "it's kind of interesting, and I enjoy now and then winning one." And he has no doubt the Paperwork Reduction Act was a big victory. It promises, he said, "to be one of the most significant and far-reaching statutes."

Reduce Costs

The law will "reduce the costs of government while improving the delivery of essential services." This is no mean feat, Brooks said, considering the threat of current federal DP practices to government efficiency and considering the public's paperwork burden that is "drowning our citizens" in a sea of government forms and reports.

For too long, he continued, agencies "have treated information as a free good" with little or no regard to the cost to the public and government or the ability of agencies to manage information.

Like Daniel in the lions' den, Brooks told his audience of federal DPers that some federal programs and systems "are so bad you can't mess them up any more, and I don't laugh 'cause I voted for most of them."

In short, he said, "government's traditional systems are breaking down under the burden." The Paperwork Reduction Act will change all that, he said, through its mandate for strong Office of Management and Budget (OMB) oversight of federal DP and the appointment high-level officials in every agency to plan and be responsible for adequate information resources management.

The appointment of these officials, according to Brooks, "provides for the first time the essential leadership and direction for government to address the information problems it faces now and in the future."

Acknowledging that executive agencies naturally resist congressional oversight, Brooks said his new legislation "is not a matter of congressional interference." Congress merely set the structure; it is up to the Administration to appoint the people and set the policies to insure the new law's success.

Adverse Reaction

Adverse agency reaction was expected, he said. "I never blame a man for trying, but it's your own fault if he succeeds," he added, promising continued congressional scrutiny of the paperwork reduction law's implementation through the yearly appropriations process. If the law fails, it will be the fault of Congress.

Brooks said he will also carefully monitor OMB implementation actions to make sure the agency does not accentuate regulatory reform at the expense of information management reform.

He also said the Defense Department, the main opponent of the legislation, will be reminded that only a limited number of sensitive, national security operations were exempted from OMB oversight of federal DP under the law.

The Paperwork Reduction Act, he said, ushers in "a new era in federal information management," an era in which "far-reaching and significant technological changes will occur in the government and in society as a whole."

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Golden Career Opportunities Sighted in IRM

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The growing acceptance of the information resources management (IRM) concept in government and private-sector organizations is providing golden career advancement opportunities for DP professionals, attendees at a recent conference here were told.

The merging of an organization's numerous information-related activities under a unified management structure "is shifting the focus of what the DP professional ought to be interested in now," IRM consultant Warren B. Buhler told a recent session of the Federal DP Expo.

Buhler was formerly director of the federal paperwork commission, whose work was a major force behind the recently enacted Paperwork Reduction Act of 1980. One of the law's main thrusts is to streamline federal DP management.

The act's provisions establish IRM as a mandatory government management concept, a move that parallels developments in the private sector, according to Buhler, who is now president of Management Design, Inc. of Washington, D.C.

During times of economic downturn, it is too expensive and unproductive to manage an organization's varied information resource in a haphazard, disjointed fashion, Buhler pointed out. This is why IRM, while not a new concept, is gaining widespread acceptance in both private and government organizations [CW, April 13].

With the growing importance of information, the person who controls these resources will obviously have considerable influence on the organization's future. In this environment, DP professionals have a leg up, IRM proponents claim, because they have basic understanding of and appreciation for the value of information.

DP managers also have valuable experience in long-range planning and in working with large budgets and varied types of personnel teams to accomplish complicated tasks.

IRM Definition

Buhler gave as an all-purpose IRM definition "the planning, budgeting, organizing, directing, training, promoting, controlling and other managerial activities involved with the creation, collection, use and dissemination of information."

It is a multidisciplinary approach to management that includes DP/telecommunications, office automation, statistics, libraries, records and paperwork management, as well as printing, publishing and others.

The goal of IRM is to manage "this information mix" to save money, reduce personnel requirements and improve productivity, Buhler said. "These are the hot buttons now, the things you will get credit for, that you will be expected to produce on."

Buhler sees this development as a challenge to DP professionals, an opportunity to get out of the "cocoon" that has grown up around data processing and rise through the organization into upper management.

To take advantage of this opportunity, Buhler recommended that DP pros:

- "Identify objectives of interests to ... management above the DP staff — to think of a management level two steps above yours and of what you can do to make a contribution at that level."
- "Develop a plan to meet those objectives."
- "Sell the plan. None of this activity means anything unless you can market your initiatives and successes," Buhler noted.

To personally prepare for the challenge, Buhler said the DP professional must broaden his or her perspectives by increasing efforts to:

- "Take advantage of training opportunities in information *and* management disciplines."
- "Make use of professional associations,
- "Broaden your lists of contacts in information *and* management."
- "Take advantage of job opportunities in the public *and* private sector."

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Offices Seen Racing to Local-Area Networks

By Bob Johnson
CW New York Bureau

NEW YORK — It's a race — a race to wire the office of the future with local networking.

That is the competitive scenario described by Dale Kutnick, director of market research for the Yankee Group, at the consulting firm's second annual symposium held here recently on "Integrating Business Machines into Local and Intercity Networks."

External transmission subsystems, which include communications processing and satellite processing, give the user access to all other satellite stations in the network or to the host computer. It is this important area that probably offers the greatest marketing opportunities in the '80s, Kutnick said.

One obstacle still to be overcome in communications processing is the "Babel syndrome," in which one piece of equipment is unable to talk to another, Kutnick said. He defined this kind of processing as, "the manipulation of data or information [without changing its content] for the purpose of abetting its transfer [and possible storage] in an efficent manner."

Functions that ought to be included in plans for communications processing are the following, according to Kutnick: code and protocol conversion; message switching and routing; multiplexing; analog to digital (and vice versa) conversion; telecommunications management; network control; and possibly auxiliary storage.

Satellite processing would include PBXs, gateway processors and communications controllers. Here, too, network planners must exercise caution. "Vendors who control the satellite processor level will control the network," Kutnick said, because vendors want to sell the peripheral equipment that goes with network equipment.

In this instance, Kutnick said, DP managers with purchasing responsibility should keep their minds open when vendors rattle off the virtues of their products, and they should remember that suppliers are always looking for an "in" for future sales.

Closed Field

In terms of host loyalty, the field is fairly closed, according to Kutnick's research. Here, IBM mainframes utilizing X.25 and Synchronous Data Link Control (SDLC) protocols are in the lead, he indicated. "By 1985, IBM mainframes not using SNA (Systems Network Architecture) and SDLC will be locked out," he predicted.

Seminar attendees agreed that hosts are of primary importance to local networks and that without them local networks are of no value. Thus the gateway processor interconnect is crucial to the entire networking system.

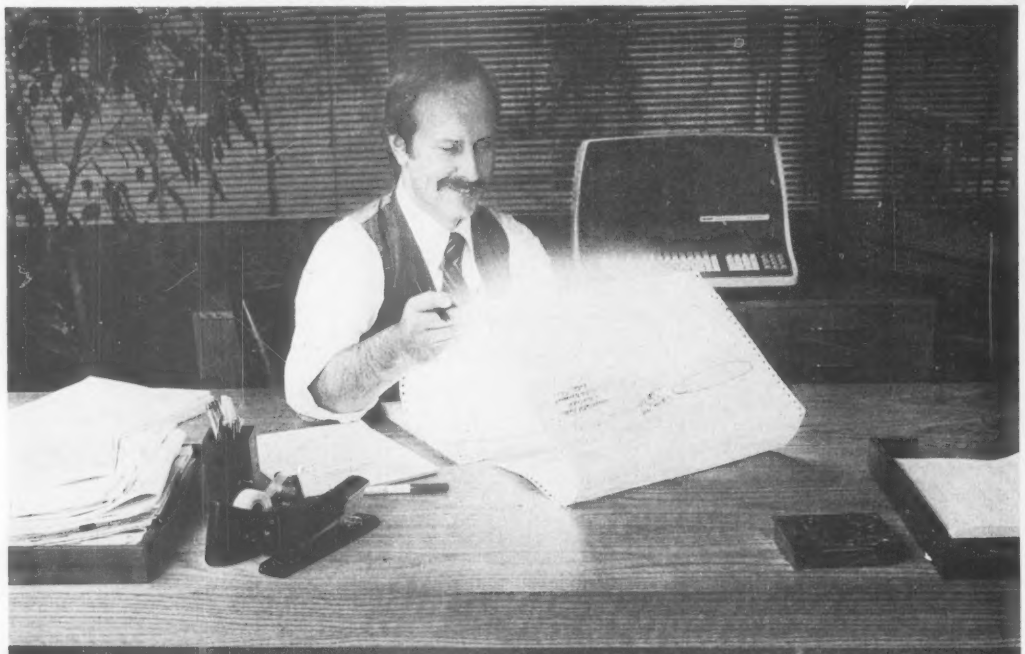
Kutnick defined a local-area network as an intraoffice (intrabuilding, intrafacility) communication system that supports "transparent" information transfer between users and/or electronic devices on the system. Kutnick stressed that communications processing functions should be done within the network.

Local nets are increasingly needed, according to Kutnick, because most business machines communicate within a local building complex, and they require an easy, efficient and coherent communications architecture to link them together.

A local network provides that mechanism. It allows a "single gateway" for interoffice communications, resource-sharing among different types of equipment, easier network maintenance, greater management control and a simpler way to allow for network expansion, Kutnick noted.

The user workstation is of prime importance, he added. It should be very intelligent, with DP functions and stand-alone processing.

When planning networks, managers should expect vendors to offer SNA and SDLC protocols to support X.25 and to offer bisynchronous and synchronous protocols. The product that will best connect to a vendor's network is his own, Kutnick suggested.



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Intel to Bring Out Ethernet Tools

SANTA CLARA, Calif. — In coming months, Intel Corp. will give users development products to fit systems for the Ethernet local network architecture, according to a statement the Ethernet codeveloper issued last week.

In about a month, Intel will introduce development tools permitting users to gain hands-on experience with Ethernet.

Users will then "be able to set up a network between development systems, write network applications programs and evaluate the network benefits in light of their data communications needs," a company spokesman stated.

Dual Use

"Programs written for the evaluation network will also be usable in the actual target system," Intel said.

Intel also plans to unveil board-level Ethernet controllers that facilitate adding Ethernet capability to prototype systems.

These boards will plug into Intel's Multibus backplane and single-board computer (ISBC) chassis for use with any of Intel's 8- or 16-bit CPU boards, such as the ISBC 80/30, ISBC 88/40 and ISBC 86/12A.

VLSI to Follow

Intel also revealed plans to market an ISBC Ethernet controller with very large-scale integration (VLSI) technology.

Intel, Digital Equipment Corp. and Xerox Corp. jointly developed Ethernet, which features a passive coaxial cable medium to move data at 10M bit/sec over distances of up to about half a mile. Xerox has already announced some Ethernet offerings.

The first Intel products for Ethernet will be introduced by the end of spring and deliveries will begin in the fall, the spokesman stated. Intel is located at 3065 Bowers Ave., Santa Clara, Calif. 95051.

Dema Chapter To Host Seminar On Data Entry

WALTHAM, Mass. — A "Data Entry Equipment Seminar" will be held here on May 15, sponsored by the Massachusetts chapter of the Data Entry Management Association (Dema).

The seminar will examine how far the data entry industry has come and the new products and services on the horizon, an association spokesman said.

Eight top industry experts are slated to discuss topics such as:

- State-of-the-art equipment, its speed and technical trade-offs.
- How to perform particular input data entry jobs.
- Future trends in data entry equipment.
- How to get the most cost-efficient analysis job.

There also will be an opportunity for questions and discussion at the full-day session, which is scheduled for 8:30 a.m. to 3:30 p.m. at the TLC Best Western Hotel, 477 Totten Pond Road, Waltham, Mass. 02154. Admission is $10.

Further information is available from Gail Caruso, Consolidated Computer International, Inc., 275 Wyman St., Waltham, Mass. 02154.

May Seminar to Focus On Security Issues

LOS ANGELES — "Information Systems: Security and Control — Challenges for the 1980s" is a one-day seminar being sponsored here by the Financial Executives Institute and the Society for Management Information Systems.

Slated for May 6, the conference will focus on security issues facing financial, auditing, DP auditing and information processing executives. Gideon I. Gartner, president of the Gartner Group, Inc., will give the luncheon address on "Anticipated IBM Strategies in the 1980s."

The seminar costs $95. More information is available from David J. Trojan, FEI/SMIS Joint Conference, P.O. Box 93, Glendale, Calif. 91209.



Some straight talk about computer terminals

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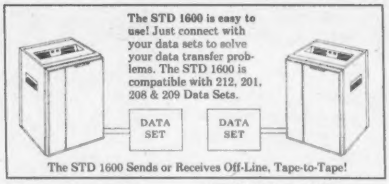
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The STD 1600 is easy to use! Just connect with your data sets to solve your data transfer problems. The STD 1600 is compatible with 212, 201, 208 & 209 Data Sets.

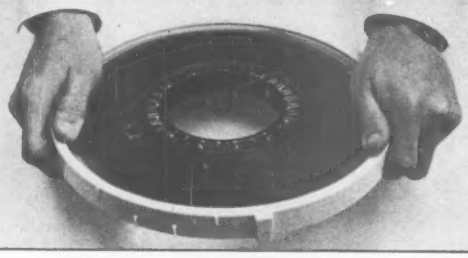
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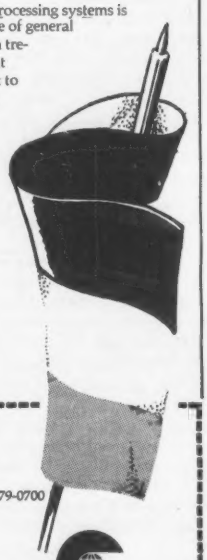
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SOFTWARE PACKAGES: Trade Secret or Patent Protection?

by Fred Greguras

Although the U.S. Supreme Court recently ruled in *Diamond vs. Bradley*, No. 79-885 (decided March 9), and *Diamond vs. Diehr*, 49 USLW 4194 (decided March 3), that certain inventions involving computer programs meet the threshold condition for a patent to be issued, these decisions do not provide another means of protection for most computer software that is developed or licensed for use in a traditional data processing installation setting.

To understand the ramifications of these decisions, it is helpful to examine what a patent is, the basic conditions for obtaining a patent and exactly what the court held in the recent decisions.

Obtaining a Patent

A patent is issued by the federal government to the first inventor of certain kinds of new and useful inventions when certain conditions are met. It provides an inventor with the right to take legal action to prevent others from making, using and selling the invention in the U.S. for a period of 17 years.

Three basic conditions must be met in order for a patent to be issued. First, the subject matter of the invention must fall within one of the statutory classes for patents designated by Congress in 35 U.S. Code (USC) §101. A patent may be granted for a new and useful process, machine, manufacture, composition of matter and for other inventions. Patents, however, may not be granted for methods of doing business, newly discovered laws of nature or for purely mental processes.

Second, the invention must be *novel*; a process, machine, product or design that is different from what has previously been discovered or is already known. 35 USC §102.

The third condition is that the differences between the invention and what is already known must be of such a character that the new discovery would not be obvious to a person having ordinary skill in the technical field related to the discovery. 35 USC §103.

It is the "newly discovered laws of nature" exclusion in the threshold condition of §101 on which the Supreme Court had previously declared certain computer software not eligible for patent protection in *Gottschalk vs. Benson*, 409 U.S. 63 (1972) and *Parker vs. Flook*, 437 U.S. 584 (1978). What the Diehr and Bradley decisions actually established was that the particular inventions satisfied this first condition for a patent. Whether the inventions satisfy the other basic conditions remains to be determined.



The rationale for excluding "laws of nature," which mathematical algorithms are held to be, is that they cannot be discovered since they have always existed and that such fundamental laws should not be preempted as a patent would do. Because computer programming is based on sequential and branching instructions expressed in general mathematical terms, that is, "mathematical algorithms," patent protection has been difficult to obtain. The sequential, methodical operation of a computer system, that is, how it works, has often been part of an evaluation of what a computer program is doing in a particular matter.

In a 1975 patent application, James Diehr and Theodore Lutton made claim on an industrial process that involves a computer program to regulate the curing time of rubber products in a mold press. The synthetic rubber seals are designed to prevent oil leakage in automobile and railroad engines and wheel bearings.

The synthetic rubber must be heated (cured) from its initial soft form to a hardness that will act as a seal. The process includes a continual measurement of the actual temperature in a mold and a computer program that repeatedly uses a well-known equation (the Arrhenius equation) to calculate the time required for cure based on the temperature in the mold. The mold press is opened automatically when the continual recomputations indicate that the rubber is to be taken out.

The claimants did not argue that the computer program itself is patentable. They asserted that the algorithm used in their invention is peripheral to the patent application and that they had created a totally new process.

PTO Position

The Patent Trademark Office (PTO) rejected the patent claim as being nonstatutory subject matter under §101. The PTO Board of Appeals divided the process into each of its steps and evaluated each of the non-computational steps to determine if they were novel.

Since none of these steps were found to be novel, the only novelty was in the isolated computational step. But, according to the PTO, that step is a "law of nature," an algorithm, under *Flook* and the process is not novel and therefore does not meet the statutory class requirement of §101.

CCPA Position

The Court of Customs and Patent Appeals (CCPA) reversed the PTO determination and held that the claim as a whole recites a method for molding rubber articles and merely employs a formula for a new and useful end without attempting to preempt the use of the formula. One of the steps was found to be novel, that is, "constantly determining the temperature" and "constantly providing [it to] the computer." The CCPA, however, held that novelty is not relevant to meeting the §101 condition.

In both Bradley and Diehr, the CCPA held that only if both the answers to the following questions are yes is a claimed invention nonstatu-

(Continued on Page 40)

IN DEPTH

Provisions of the Computer Software Copyright Act of 1980

*SEC. 12. (a) Section 101 of title 17 of the United States Code is amended to add at the end thereof the following new language:

"A 'computer program' is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result."

(b) Section 117 of title 17 of the United States Code is amended to read as follows:

"§117. Limitations on exclusive rights: Computer programs.

"Notwithstanding the provisions of section 106, it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:

"(1) that such a new copy or adapation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or

"(2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.

"Any exact copies prepared in accordance with the provisions of this section may be leased, sold or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale or other transfer of all rights in the program. Adaptations so prepared may be transferred only with the authorization of the copyright owner."

(Continued from Page 39)

tory under previous Supreme Court decisions.

• Do the claims directly or indirectly recite a mathematical formula or a specific method of calculation?

• Would enforcement of those claims prevent everyone from solving the equation or carrying out the calculation?

Thus, essentially, the CCPA would find a claim nonstatutory only if it would wholly preempt the mathematical formula, not merely because the invention involves a computer program.

There is language in the Flook decision that supports both the CCPA and PTO approaches. In Flook, the majority of the court states that its decision does not incorporate §102 novelty tests into §101 determinations, but the dissent stated that the majority does.

Supreme Court Position

The Supreme Court, by a 5-4 vote, narrowly agreed with the CCPA'S holding.

The court essentially adopted the CCPA test of viewing the process as a whole and took the position that a novelty determination is not part of the §101 requirement. "A new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made."

Writing for the majority, Justice William Rehnquist stated that industrial processes such as this are the type that has historically been eligible to receive the protection of our patent laws. The court held that the two inventors do not seek to patent a mathematical formula. "Instead," wrote the justice, "they seek patent protection for a process of curing synthetic rubber. Their process admittedly employs a well-known mathematical equation, but they do not seek to preempt the use of that equation. Rather, they seek only to foreclose from others the use of the equation in conjunction with all of the other steps in their claimed process."

In an important finding, the court held that the post-algorithm activity or steps in the process must be "significant" in order to satisfy the §101 condition.

Justice Rehnquist added, "Our earlier opinions lend support to our present conclusion that a claim drawn to subject matter otherwise (patentable) does not become (nonpatentable) simply because it uses a mathematical formula, computer program or digital computer."

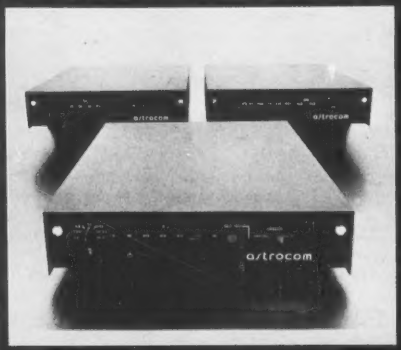
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OVERKILL?

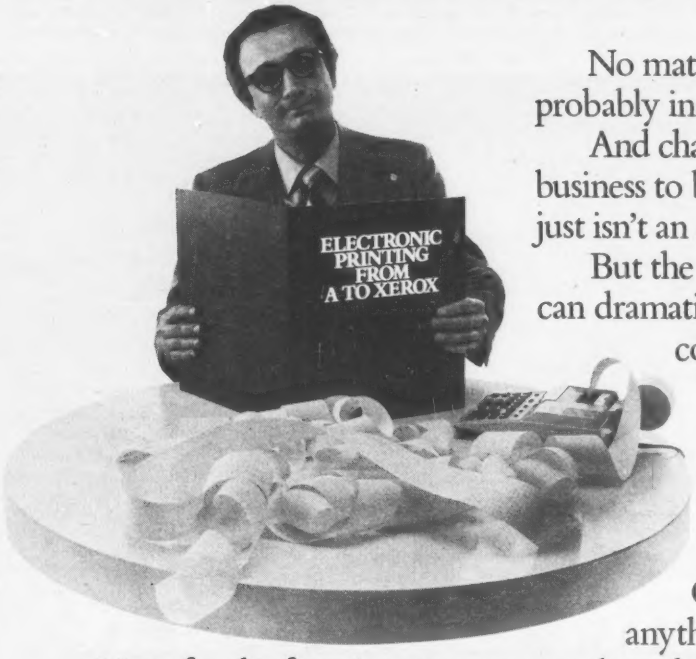
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(Continued from Page 40)

The four dissenting justices basically adopted the PTO position and charged that the rubber curing process was not unusual or novel and was based on a method of calculation, conditions which would make it unpatentable.

Justice Stevens, who wrote the dissenting opinion, stated: "As the court [majority] reads the claims ... the inventors' discovery is a method of constantly measuring the actual temperature inside a rubber molding press. As I read the claims, their discovery is an improved method of calculating the time that the mold should remain closed during the curing process."

'The more physically fixed or embodied a computer program is in the hardware, the more likely it will be found patentable by analogy to traditional hardware. As the line between software and hardware blurs, the possibility of patent protection increases since traditional hardware in computer systems is within the scope of §101.'

The Bradley Case

The other recent Supreme Court decision stems from a 1975 patent application made by John J. Bradley and Benjamin S. Franklin for a firmware invention. This invention combines computer hardware (a control unit) permanently programmed with microcode, a sequence of computer instructions, to improve the speed and efficiency of the computer for operating in a multiprogramming mode.

The inventors compare their invention to the recently advertised Cadillac that changes from four to eight cylinders according to the power needs of the car.

The PTO refused to issue a patent, stating that its only novel aspect was an "algorithm," a step-by-step procedure.

The CCPA reversed the PTO Board of Appeals, holding that what the computer does in a specific situation and how it does it must be distinguished. Last month, by a 4-4 vote on March 9, the Supreme Court, without clarification, affirmed the CCPA's holding that this particular invention meets the §101 requirement.

Firmware inventions are more likely to be patentable since a general-purpose computer is not involved. Most microprocessors with firmware have only one intended end use which would limit the scope of what a patent claim could preempt. Patent protection is important to the microprogramming industry since the use of chip technology is expanding into an ever-widening array of products, including almost every commercial and consumer product that runs on electricity.

The more physically fixed or embodied a computer program is in the hardware, the more likely it will be found patentable by analogy to tra-

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TRADE SECRET OR PATENT?

ditional hardware. As the line between software and hardware blurs, the possibility of patent protection increases since traditional hardware in computer systems is within the scope of §101. Whether firmware may be patented could also depend on whether the claims are phrased as hardware architecture or as process or "means for" claims.

On the other hand, the more readily programmable, or alterable, a program is by the user, and the more it can be isolated from the hardware or an industrial process, the more likely the software will be considered an algorithm for the purpose of patent protection. "Stand-alone" system and application software packages such as general ledger, payroll systems or data base management systems would normally fall into this category. The Diehr case does indicate that an industrial process that includes a computer program as a component part meets the §101 condition for a patent to be issued if the post-algorithm activity is significant.

Still Unclear

In comparison with copyright protection, as the line between traditional software and hardware blurs, it is still not entirely clear to what extent chip technology may be copyrighted even under the 1980 amendment to the Federal Copyright Law. Further, patent protection provides protection for the whole process unlike the image protection provided by copyright law.

It is important, however, that even if the §101 statutory class condition of the patent law is met, the requirements of §§102 and 103 must be satisfied.

It can be costly and take years to obtain a patent. On the average, it now takes 23 months for an application to be processed and this time frame is lengthening. A discovery might not have any commercial value by the time a patent is issued, assuming the application is successful.

In contrast, it takes relatively little time to establish copyright or trade secret protection. Further, the term of patent protection is only 17 years as compared with at least 50 years under copyright law and the unlimited duration of trade secret law, if the trade secret is protected.

Thus, trade secret protection in a controllable distribution and copyright protection in the home computer industry and other "off-the-shelf" public distributions will continue to be primary methods of protecting software assets.

Fred Greguras is an associate with the law firm Kutak Rock & Huie of Omaha, Neb.

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EDITORIAL

Serious Threats

The present Congress may have to vote on proposals for creation of at least two giant computerized data base systems — one to store the names of all lawfully employed Americans, the other to list all welfare recipients.

The first system is intended to discourage employment of illegal aliens, according to backers of the plan, among them the Select Commission on Immigration and Refugee Policy. The commission has estimated that the system would cost $90 million over six years, but a technical expert involved with the commission's research on the matter has told *Computerworld* that development and implementation could run as high as $1 billion [CW, Feb. 9].

The second system is aimed at discouraging welfare fraud, according to its supporters, one of whom is the Secretary of Health and Human Services, Richard S. Schweiker. This Reagan administration plan was recently assailed by the American Civil Liberties Union (ACLU) on grounds it would violate existing federal privacy laws [CW, April 20].

Employment of illegal aliens is seen as a major economic problem in large parts of the U.S. The Work Permit Authorization Enrollment and Verification System (WPAEVS) envisioned by the Select Commission on Immigration and Refugee Policy would be fed batch data on the nation's lawful labor force at some 2,500 U.S. Labor Department centers. WPAEVS advocates have maintained the system will help law enforcement agencies apprehend illegal aliens, reducing their alleged threat to authorized workers on the job market.

Under the WPAEVS scheme, American workers would be required to carry work authorization cards corresponding to computer-stored records. Law enforcers could then easily check whether a given work card was bonafide, one supporter claimed, by searching for matching records somewhere in the system.

The National Recipient Information System (NRIS) proposed by the Reagan administration is similar to systems proposed by the administrations of Lyndon Johnson, Richard Nixon and Jimmy Carter. According to an ACLU spokesman, the earlier schemes were blocked by various congressional committees when opponents raised privacy issues.

In storing identities of some 25 million public assistance recipients, NRIS would be a "gross violation of existing federal laws designed to protect the privacy rights of all individuals," ACLU National Director John Shattuck said recently.

Harvard Law School professor Arthur R. Miller has warned that computer-stored data is often interpreted "out of context" and is subject to errors that go undiscovered for years. For those reasons, WPAEVS and NRIS are serious threats to the privacy rights of Americans.

When costs of development and implementation are also considered, such systems seem ill-advised and unwarranted burdens on the nation's taxpayers.



DATA PAST

Five Years Ago
April 26,1976

BALTIMORE — The General Accounting Office (GAO) found the Social Security Administration (SSA) used only about 40% of the capacity of its 17 large-scale computers. However, at the time the report was issued, the SSA had four IBM 370/168s on order. If installed, they would represent an increase of more than 40% in the SSA's large-scale computer capacity, according to an SSA programmer.

Ten Years Ago
April 28, 1971

WASHINGTON, D.C. — The Fair Credit Reporting Act, designed to protect consumers against harm from inaccurate information in data banks, took effect more than two years after it had first been proposed by Sen. William Proxmire (D-Wis.).

LETTERS

NCR's Plans

Prof. Philip H. Enslow Jr. of the Georgia Institute of Technology reportedly indicated disbelief when I stated at Interface '81 that NCR Corp. is planning to support the concept of Open Systems Interconnection ["NCR to Back Net Standards, OSI," CW, April 6].

I should like to point out that there is no inconsistency in NCR's development of its Communication Network Architecture (CNA) and our company's endorsement of OSI.

NCR's responsibility as a computer systems vendor is to be able to offer our users and prospective users a comprehensive and efficient network architecture that will satisfy their current requirements. We cannot expect them to wait for an indefinite period of time until the still-evolving OSI formats and protocols are completely defined and widely supported. However, when that does occur, we expect to be among the first to support OSI by offering products that facilitate its implementation.

W.S. Anderson
Chairman of the Board
NCR Corp.
Dayton, Ohio

No Conflict

I can no longer hold my peace regarding the current dispute over the Cobol-81 standard. All *Computerworld* writers seem to miss a very important point: that there is indeed no conflict!

Let me explain how the potential problem is handled in Hewlett-Packard Co.'s Cobol II compiler (which currently supports Cobol-68, Cobol-74, certain nonstandard aspects of IBM Cobol and HP's own extensions to the language). One can specify via a compiler-directing statement which standard one wishes to use. One can even specify which implementation level to use, as specified by the American National Standards Institute. Aspects of the source code that do not meet the criteria selected are flagged at the WARNING level.

What this does is place control of the issue where it belongs — in the hands of whomever maintains the documentation files at each site. The site can enforce the set of standards it wishes to use, but allow exceptions where they are granted by whomever is in charge.

Let's let the Cobol standards people do their job in pointing us to the future. It is the responsibility of the software vendors to provide the interface between those standards and the real world.

John Beckett
Director of Computer Services
Southern Missionary College
Collegedale, Tenn.

'Clouded' the Issue

The explanation of the photograph on the cover of the latest *Computerworld Extra!* [March 18] would put most soap operas to shame. Phrases such as "gathering storms ahead in data communications," "pierce the dark clouds on the horizon" and "a bright new day in data communications" slightly overdramatize the point.

Stick to the facts, CW! Don't "cloud" the issue with superficial ideas.

Bruce D. Heilbrunn
San Diego, Calif.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, Rt. 30, Framingham, Mass. 01701.

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SOFTLINE/Werner L. Frank

Prospects Brightening for DP Productivity

Most industries throughout the world are focusing their attention on increasing productivity. This seems to be a natural reaction to inflationary tendencies.

We are therefore not surprised that productivity issues have also come to the fore on the data processing scene. But here the issue is immediately associated with software rather than hardware.

The hardware people certainly don't have much to complain about when it comes to productivity. Continual improvement in cost-effectiveness of delivered hardware is testimony to ingenuity in engineering design and production.

But seemingly, software largely fails on all counts. It has become the primary focus for improving productivity in the use of the computer.

Three Main Activities

Productivity issues fall into three clearly distinct activities as they relate to the creation and operation of software. The first concerns itself with the actual process of developing or implementing the software. A second aspect of productivity relates to the operability and maintainability of the software after it has been produced. The third factor concerns itself with the performance of the software/hardware combination and considers the issue of productivity from the conventional unit cost improvement point of view.

While all three aspects are of course related, they deserve independent study if one seeks to enhance overall productivity.

The problem is one of measuring productivity in a fast-changing environment. Computer professionals waste a lot of time in counting and averaging lines of code produced as a means of achieving a productivity indicator. However, the number of lines of code produced by an individual is no more an indication of productivity by itself than is knowing the amount paid for a kilowatt of electricity in operating the computer.

The hardware people certainly don't have much to complain about when it comes to productivity. Continual improvement in hardware cost-effectiveness is testimony to ingenuity in engineering design and production. But seemingly, software largely fails on all counts. It has become the primary focus for improving productivity in the use of the computer.

An example may be instructive. An IBM executive noted that substantial progress had been made in increasing the productivity and quality for delivering IBM systems control programs. Specifically, he cited data for two 10-year periods which showed a doubling of lines of delivered code produced per staff member and a reduction of errors per 1,000 lines of code by an order of magnitude.

This, of course, is impressive and unquestionably shows increases in lines-of-code productivity. However, because of the increasing demand and complexity of the required solution, the total amount of code had increased in these periods by a factor of more than eight, resulting in a quadrupling of the staff.

While it is true that unit production had increased, it is not clear that overall productivity had improved.

Productivity is the ratio of output to input where input includes labor, capital, material and energy. Probably the best we can do in DP is to track the change in this function over time so that we can determine productivity trends. And the most likely quantifiers of output, for a given amount spent, are the following:

- Unit cost of a product (for example, an invoice or paycheck).
- Turnaround time for a request.
- Ability to meet user deadlines.
- Relevance of information received by the user.
- Number of user complaints.
- Computer uptime.
- Rerun time.
- Average on-line response time.
- Length of computer outage.

After these factors have been appropriately weighted and normalized, a production index can be computed as a function of these measurements. This index can serve to track DP performance and its improvement.

Watch Out

A word of warning is in order, however. Computer applications have a way of becoming more complex over time, either because more data processing details are added (for security, recovery, audit and so on) or because the computing is more demanding (another government report, more reductions and the like). Thus, the output may not be identical from one period to another and allowance must be made to assure comparability.

The almost desperate need for assistance in meeting the productivity gap in system development and operations has not been lost upon the various vendors of both hardware and software. Indeed the trade journals abound in advertising claims of productivity enhancers to attract the user community.

A recent review of such periodicals yielded the following claims by various suppliers for their offerings:

- Trims software development time by up to 75%.
- Boosts programmer productivity up to 75%.
- Saves 54% in development, 70% in maintenance.
- Increases programmer productivity by 40%.

(Continued on Page 52)

READER COMMENTARY/Judy Walden

The Kingdom of Transformation

I am a wizard in the magical Kingdom of Transformation and I slay dragons for a living.

Actually, I am a systems programmer. One of the problems with systems programming is explaining to noncomputer enthusiasts what that is. All of the terms I use to describe my job are totally meaningless to them.

Usually my response to questions about my work is to say as little as possible. For instance, if someone asks what happened at work this week, I say, "Nothing much," and then I change the subject.

With the assistance of my brother, a mechanical engineer, I have devised an analogy that everyone can understand. The analogy describes the Kingdom of Transformation, where travelers wander and become magically transformed. This kingdom is the computer and the travelers are information. The purpose of the computer is to change information to a more meaningful form. The law of conservation applies here: The computer never creates and never intentionally destroys data.

With no further ado, let us travel to the Kingdom of Transformation:

Far, far away, there is a magical kingdom called the Kingdom of Transformation. A king rules this land and employs a Council of Wizardry. The main purpose of this kingdom is to provide a way for neighboring kingdoms to make their citizens more useful. This is done by letting the citizens enter the kingdom at one of its ports and travel any of the kingdom's many roads. Citizens are magically transformed along the way. The income of the Kingdom of Transformation comes from the many toll roads within its boundaries.

The Kingdom of Transformation was created when several kingdoms got together and discovered a mutual need for new talents and abilities for their citizens. They employed CTK, Inc. (Creators of Transformation Kingdoms, Inc.) to create this kingdom. CTK designed the country, its transportation routes and its laws of transformation and created the major highway system.

Hazards

Because magic is not truly controllable, CTK invariably but unknowingly creates dragons. Dragons are huge fire-breathing beasts which sometimes injure or kill travelers. Fortunately they do not travel but always remain near their den.

The kingdom has other potential hazards. As the roads become older and more weatherbeaten, potholes develop, trees fall on travelers and so on. CTK maintenance men are called to fix these problems.

Wizards

The wizards play a major role in creating and maintaining the kingdom, but get little credit for their work because it is performed secretly. The wizards do not want the workers or travelers to learn their incantations because many laws would be broken and chaos would result.

CTK's grand design is always general enough to be applicable in many different situations. As a result, it is often difficult to use. The first duty of the wizards is to tailor the transformation laws so as to be more beneficial and easier to use in their particular environment.

After creation of the kingdom, a major duty of the wizards is to search for and kill dragons. If travelers do not return on time or if they return injured, the ruler of the country contacts the wizards. If the wizards determine that the injury or death occurred because of the traveler's negligence, they provide the traveler's country with additional warnings. If not, they must determine if the cause was a road hazard or a dragon. If they suspect a road hazard, they call in a CTK maintenance man to locate the hazard and eliminate it, as in repairing the pothole in the road. If they think the cause was a dragon, they must find it and slay it.

Biggest Challenge

The most difficult part of eliminating a dragon is finding it. Sometimes the wizard magically knows where the dragon's lair is, but often the wizard must send another traveler along the same route and watch to see where he disappears. This sounds like a fail-safe method for finding dragons (and a suicide mission for the traveler), but the second traveler does not always disappear. Some dragons eat any traveler who comes too close; others are very picky.

The wizards may call in CTK, who designed the highway system and transformation laws, to help devise a way to locate the dragon. CTK also helps provide the right spell or incantation to slay the dragon. (There is no general spell for slaying dragons; each dragon must be eliminated with a different one.)

Because neither CTK nor wizards are perfect, spells do not always work correctly. At best, nothing happens when the wrong spell is uttered. At worst, the dragon becomes

(Continued on Page 50)

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LETTERS

Turned Off

I have been a reader of *Computerworld* publications for several years and find many of the articles and advertisements quite interesting and useful in my profession. However, the advertisement by United Peripherals entitled "Up Yours" (March 30) has totally turned me off.

I feel that common street language is uncalled for in a publication that is highly regarded in the trade. CW has a responsibility to its business community and should not insult its readers with offensive ads of this nature.

Edwin S. Amira
New York, N.Y.

Just Testing

I've read in *Computerworld* and other publications about the concern women show and express over being "left out" and/or being treated unequally. So . . .

It may be true that God created woman from man, but like any good DPer, God knew to run a test prior to launch.

Ernest A. Thomas II
Lynnwood, Wash.

Spectrum of Talent

According to Dixon Doll's interview in the March 18 *Computerworld Extra!*, his peers talk about the lack of American graduate students in the engineering disciplines, the fact that salaries for people with master's degrees have gone up into the $20,000s, the diminishing emphasis on the market for doctoral-level graduates and the lack of graduate professionals entering the marketplace.

In the eyes of many, there are several factors causing the shortage of people with insight within our industry.

Start with the inadequate utilization of people talents. There are many nondegreed individuals who have spent 20 to 25 years in the DP profession, from marketeers to engineers, who have the foresight and the disciplines of which Doll spoke. These people, trained to a great extent by the IBMs, DECs and Sperrys, are now involved in peripheral activities and as consultants. This is partly because the big mainframe vendors feel that having several degrees is all-important.

The degrees are necessary in certain environments, but we are not realizing the potential of the nondegreed. In the early '70s, IBM implemented a "marketing resources program"; has anyone determined what success this innovative program met with?

Another factor, the elimination of the Selective Service system, has dried up the resource that a good many companies used in the past for their talent pool in the administrative and engineering areas.

The constant cross-breeding, intusion of new blood and ideas and the disciplines that go with military training can only strengthen and vitalize the industry.

Yes, we need the degreed professional, but we should not overlook the entire spectrum of talent that is available within the industry.

Philip P. Quartararo
Whitestone, N.Y.

Good Ole Days

My manager and I were reminiscing recently about the "good ole days" of punched-card processing (407, 604, sorters, collators — remember those?). He was a night-shift operator for a large manufacturer in Southern California. The company had a large inventory system, complete with tub files, and every month they were out of balance a small amount.

This went on for months, and no one could solve the problem.

Well, late one evening, by chance, my manager happened to notice the cleaning lady going about her chores. She was sweeping the area, and when she had the trash in a little pile, she nonchalantly took a card from the tub file, scooped the trash on it and threw all in the trash can!

End of mystery.

After explanations and instructions for her to use a blank card for her dust pan, she said, "This sure works better than the one with the little holes in it."

George E. Peacock
Anchorage, Alaska

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LETTERS

Too Emotional

"Managers Urged to Talk Less, Listen More" [CW, March 30] was very incisive and offered much in the way of constructive guidance to data processors.

However, one important factor of the communications mechanism was not discussed. Most user representatives approach a discussion with an emotional concentration on their problems. If the interplay is not conducted properly by a methodical approach to systems analysis, there is a good chance that important points will be overlooked. This tends to produce a negative atmosphere which is defined as, "That's not what I meant," when the initial solution is reviewed. After that, communications is hampered by mutual mistrust, and the finished product never has the glitter it should have had.

Because systems personnel have the training and experience that is essential to an effective review, the "procedural style" can provide the guidance and depth that will normally produce more satisfactory results. If this practice is adhered to, the users will come to meetings better prepared to discuss their problems and enjoy the process as well.

E.J. Kissner
New York, N.Y.

Two Definitions

"IBMer Describes How Managers Communicate" [CW, March 23] expressed an overall view that typifies many attempts to apply interpersonal communications principles to the DP environment. The definition implicit in the description of communication as a function of speaking, listening and writing is that of "transmission of information," which is out of context to the subject matter.

The accepted definition in interpersonal communications is "the generation and attribution of meaning"; this definition places emphasis on maximizing shared meaning between persons who participate in the process — not necessarily the processes themselves.

Managers do not communicate any differently from the rest of us. We all adjust our communications and develop styles. Whether these styles are appropriate and facilitate communication is another matter entirely. If I continue to use an inappropriate style, ignoring cues from subordinates who attempt to have me change, I can still be an accurate communicator. Indeed, part of my message is "I don't care how you feel about my style; I'm going to use it anyway."

The DP definition of communications as the transmission of information has an influence on how DPers approach interpersonal situations. Jack Stone, in the same issue, mentioned the propensity of managers to be demanding and ignore human problems. By this definition, there is nothing wrong with that approach. It is sufficient to ensure that the message is accurate and transmitted.

By changing the definition to "the generation and attribution of meaning," the emphasis shifts to whether messages are received as intended. This is not semantic quibbling — it reflects a basic difference and approach to communications.

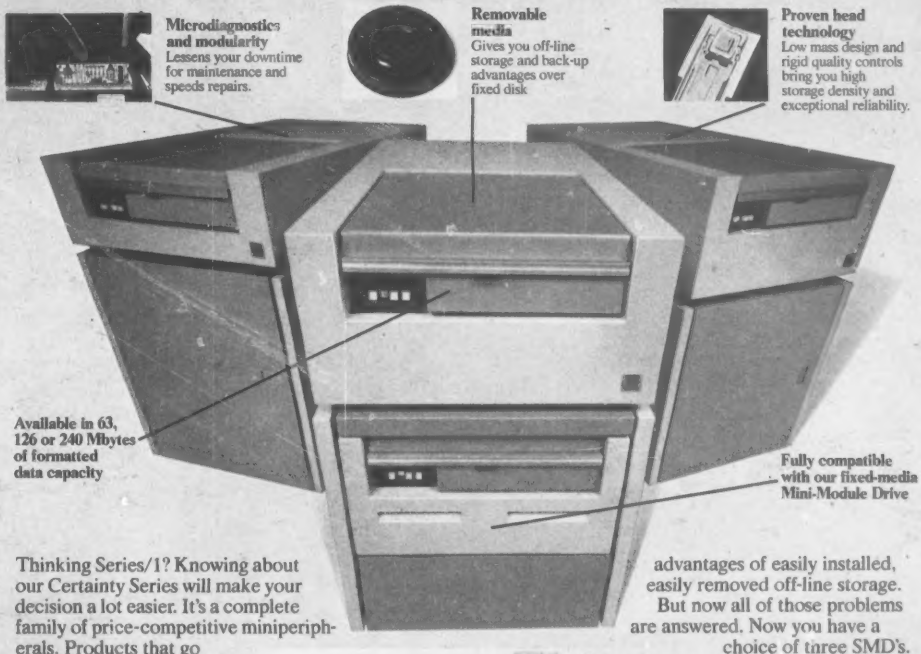
There could be some benefits to the DP field in using the latter definition where it applies. Customers are often frustrated by not being able to express their problems. Although there may be a number of reasons for this, one is that too often their responses are based on their words rather than their message. They become frustrated and repeatedly attempt to "clarify" the problem.

The total communications climate is just as important, in the long run, as the production schedule. *Computerworld* has pointed out that turnover is less a problem in the small organization than in the large ones. In the latter instances, supervisors are farther removed from subordinates and messages are frequently filtered through several layers of mid-level managers who do not accurately express the real problems. This is only part of the overall communications barrier in large organizations, but an important one.

Dennis Poindexter
Southport, Ind.

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LETTERS

Office Layout

Computerworld publications are excellent tools for keeping oneself abreast of the ever-changing technology and management concepts in data processing. However, one management concern that I have not seen explored or advertised in CW is the physical layout of the work environment.

My concern here is for the programmer, systems analyst, project leader, systems programmer and manager work environments. Related topics include:

1. Open-office concept vs. private offices.
2. Sharing offices and its effect on productivity.
3. How much and what design of furniture and equipment provide the best work space for these different levels of staff.
4. Noise levels and productivity.
5. Employee morale factors.

I am faced with designing an office layout for our management information systems department in an existing office environment. I am in touch with office design specialists, but they tend to emphasize the ideas and "facts" that support their line of products.

Perhaps CW could request input from its readers on this topic. It would be valuable to find out what programmers and analysts think about the various offices in which they have worked. Comments and suggestions from other people who have preceded me in this assignment would also be beneficial.

Erwin J. Hein
Batesville, Ind.

GOTOs, Minis

It is truly amazing that with all the hoopla over the past months concerning structured Cobol programming and the use of the GOTO, no one has seen fit to examine

Wizards and Dragons

(Continued from Page 45)

much larger or multiplies into several dragons. In either case, new spells must be found.

If all existing dragons are quiet (in other words, have eaten sufficiently), wizards have time to do other things. They hide in castles and practice spells and incantations. They also devise shortcuts for travelers and new laws of transformation.

Changes in the Kingdom

As new transformation kingdoms are created and old ones are maintained, CTK, Inc. constantly learns new things. It learns ways to avoid creating some of the dragons it has created before. It also discovers new and better laws of transformation.

As a result, CTK periodically creates a new grand design that is far better than the old. The wizards determine when this new design should be brought in. This usually happens when the tourist season is slow or when no important travelers are scheduled to arrive. The kingdom must be closed for the actual implementation and is later reopened as a new and better place to go.

A final question you might ask is what happens when the number of tourists becomes too great for the kingdom to handle in a reasonable period of time (that is, the tourist lines at the ports are too long). The Kingdom of Transformation has three options: 1) shorten the paths that a tourist must travel, 2) convince CTK to develop a faster breed of horses so travelers can finish sooner or 3) annex more territories so the kingdom can handle more travelers.

Thus ends the story of the Kingdom of Transformation. If you did not recognize some of the players, here is a short dramatis personae:

CTK, Inc. = IBM.

King = computer center director.

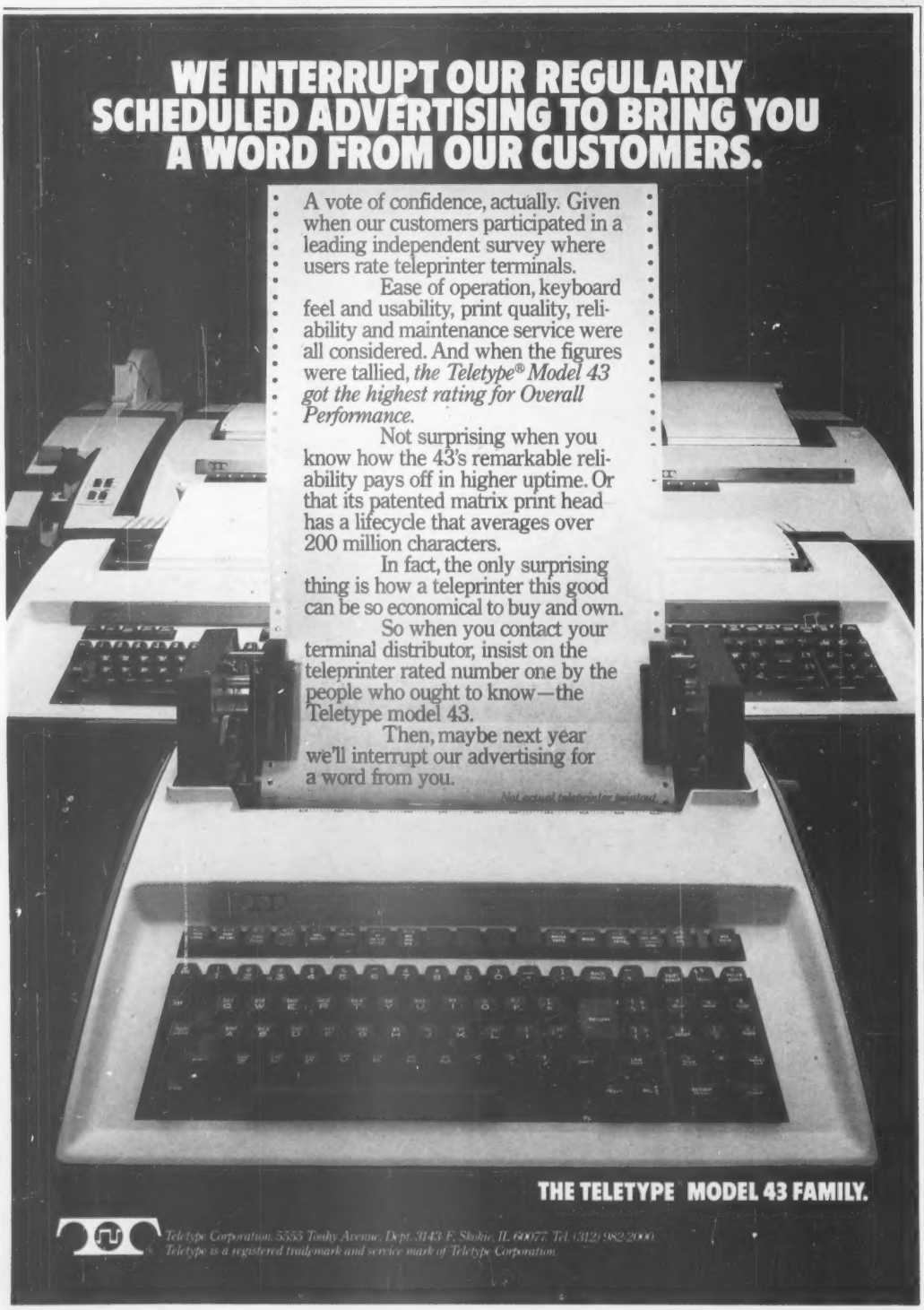
Wizards = systems programmers.

Dragons = IBM software bugs.

Road hazards = IBM hardware bugs.

Maintenance men = IBM customer engineers.

Walden is systems software design manager at Clemson University's computer center in Clemson, S.C.



the problem from the viewpoint of the minicomputer programmer. (Given the recent explosion in minicomputer Cobol-based applications, this in itself suggests that most contributors to the debate have little contact with prevalent programming problems.)

In essence, the 32K-word program size limitation of 16-bit virtual machines, especially those using segmented overlaying (such as the Digital Equipment Corp. PDP-11 series with RSX/11 operating systems) force the use of upward-directed GOTOs to control looping, if acceptable performance is to be obtained.

In sophisticated applications using many files and large working storage sections, the root segment often approaches or exceeds 30K words. With less than 2K words available to actual application code, the programmer must carefully segment code in order to produce an executable program. If a control segment governs the execution of a subordinate segment by the approved method of "PERFORM xxxx UNTIL yyyy=zzzz" in such a system, an analysis of the code's performance will show the primary system activity to be the thrashing in and out of the control and subordinate segments. This must be so, since the executable code governing the perform resides with the performing segment and is swapped out to disk at each execution of the performed code.

The solution is simply to govern the performed segment internally through the use of GOTO as in the following example.

```
.
.
.
.
 PERFORM    9999-READ-MASTER-
FILE.
.
.
.
.
9999-READ-MASTERFILE
SECTION 35.
9999-START.
  READ MASTERFILE NEXT RECORD
     AT END GOTO 9999-EXIT.
  IF MASTER-REC-CODE = DESIRED-
REC-CODE
     PERFORM  XXXX-PROCESS-DE-
SIRED-RECORD.
  GOTO 9999-START.
9999-EXIT.
  EXIT.
```

Obviously, the efficiency gains of a GOTO-controlled segment over a PERFORM UNTIL segment depend upon the number of executives of the subordinate segment and the execution time of that segment relative to segment overlay time. If the "desired-rec-code" were found in only a small proportion of records in a large file, the efficiency increase would be enormous. I know of one case where recoding a PERFORM UNTIL to an internally GOTO-controlled loop decreased program runtime from more than three hours to 45 minutes.

There are other situations, especially involving the control of on-line programs, where classical structured methods are inappropriate or simply wrong.

This is not to say that there are not good and bad programming practices, which we would be wise to study, but rather to point out that academically or "think tank" derived methodologies which abstract programming standards away from the consideration of actual machine operating architectures and limitations or performance criteria will have limited applicability in the real world.

Ronald M. Castonguay
Nashville, Tenn.

LETTERS

Happy Reader

I recently started my subscription to *Computerwold* and find it a very informative and challenging newspaper. I presently work for Uncle Sam as a systems analyst on the Honeywell 2000 (DOS).

I am amazed at the different types of equipment and software I find out about while reading CW.

I believe the computer field offers endless possibilities to a young person. I got into this field when I was about 40, and now that I am 50, I am still excited by its challenges.

CW has indeed broadened my background.

Anthony Garbarine
Middletown, N.J.



Prospects Rising for Software Productivity

(Continued from Page 45)

- Increases productivity 25% to 40% through improved programming.
- Increases application development productivity by two to one and as much as 20 to one.
- Increases programmer productivity by 21% and meets completion targets 94% of the time.
- Produces results in one-fifth the time for a 400% productivity gain.
- Productivity improvements averaged approximately 160%.

As can be seen, productivity claims are related to a variety of functions including production rate, production schedule and maintainability.

The quantifiers are also mixed since, in some claims, we are told of improvement potentials and in others of potential reduction in a variable. These measures are, of course, related by the expression: $P=100R/(1-R)$, where P is the percent improvement and R is the realizable reduction. In other words, trimming a measure of work by 25% or 75% leads to a productivity increase of 33% and 300% respectively.

One might deduce from any one or more of the above assertions that productivity salvation is at hand. Indeed, it may be feasible to increase productivity in one particular activity of the overall application cycle, and it may even be possible to increase such productivity by a substantial amount if the particular application meets certain limited criteria and constraints. But unfortunately the matter is not that simple.

Let us take three representative examples and analyze the potential productivity increase that is realizable with today's technology.

We first select the optimal situation. A business is in need of a general ledger system, and its choices are to purchase a system or build it in-house.

It is now clearly established that ledger systems have evolved to a point where they are state of the art and available off the shelf. The alternatives for a business seeking a ledger system are therefore economically clear. Purchasing a system from an outside source displaces internal development costs and eliminates the risk of undertaking a software project with all its known economic pitfalls. The purchase also makes the system available immediately, thereby achieving opportunity costs. The system is maintained by an outside organization so that maintenance costs are supported by many users.

Given the applicability of the off-the-shelf software to the business, productivity achievement is maximized by this purchase option. Under these circumstances there can be no better solution for more cost-effective processing.

Frequent Problem

We examine a second example. The user wishes to maintain a file of information relating to specific transactions that occur from time to time. The user requires a variety of periodic reports reflecting the content of the file information and wishes to make ad hoc queries from time to time. Hence the DP functions are quite simple and standard.

The problem as stated is one that occurs quite frequently among end users. It is also a general problem inherent in many commercial activities for which computers have not as yet been utilized. Users are often deterred from employing a computer because they feel access is difficult or because individuals are not aware that computers could easily be used to help process such information.

But self-contained "solution" systems, often offered by the commercial time-sharing services, are the answer to solving such problems and providing a highly productive and cost-effective remedy. Thus is made the case for any standard data base management system, providing it has an appropriate front-end user query and reporting system. Commercial examples are the Nomad system of National CSS, Inc. and Ramis II of Mathematica, Inc. Productivity improvements can be astounding for those instances when results are achievable by stating a problem instead of programming a solution.

This brings us to the third and most difficult problem, namely the design and implementation of a new application which cannot directly benefit from existing off-the-shelf software nor be implemented efficiently through a solution system.

In this case, all of the classical life-cycle activities of an application must be engaged, beginning with establishment of requirements, development of the design and specifications, detailed programming, thorough testing and subsequent operation and ongoing maintenance.

Here we must bring to bear the best approaches and techniques that technology affords. We will discuss this situation in an upcoming article.

Frank is executive vice-president of Informatics, Inc. in Woodland Hills, Calif.

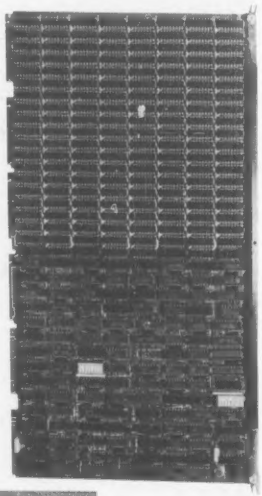
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'Hawkins Has the Best Memory of Anyone in the Company.'

Software Testing — Part 2

Bottom-Up Approach Yields Precision

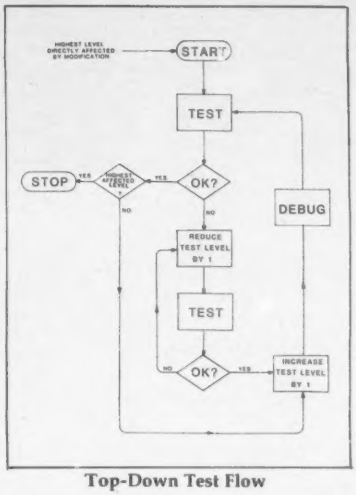
By A.F. Grilz
Special to CW

Two methods are generally used for software testing. These are the top-down approach — often used in minicomputer environments — and the bottom-up

Top-down or bottom-up testing — which is the better approach for software quality assurance? In Part 2 of this three-part series on software testing, Grilz gives his views along with recommendations for test data creation.

pproach, which is often avoided rather han utilized (see related diagrams).

With the top-down approach, the initial est is performed at the highest level of oftware affected by the change. A softare change includes any action which ill alter the software level. This could be ie addition of new software, a modificaon to existing software or the deletion of oftware.

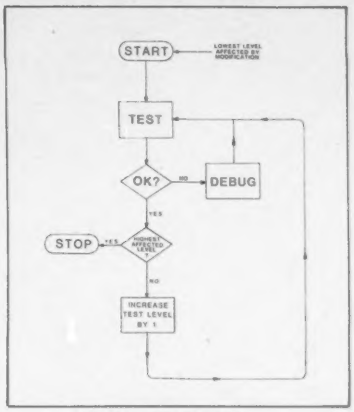


Top-Down Test Flow

If the highest level tests out correctly, the other levels are assumed to be in working order and the test is complete. The usual rationale for this method is based on the hope that success will be achieved on the first attempt.

If the highest level does not check out satisfactorily, the testing proceeds downward through subsequent levels until a level that works is found. The tester then returns to the next level (the lowest level

(Continued on Page 58)



Bottom-Up Test Flow

Tool for IBM Sites Cuts Debugging

AVON, Conn. — The Debugging Controller (DBC), a software package claimed o cut debugging time for assembler lanuage programs by up to 80% and speed ystem development at large-scale IBM inallations, was introduced here by Comuter Systems Research, Inc.

A major feature of DBC is its comprehenive use of symbols which reduces the prorammer's need to consult source program listings for locations and offsets. The package also includes an ability to perform tracing functions, including instruction tracing, various types of branch tracing and loop tracing.

It is capable of setting traps at problem points within the program; manipulation and display of symbol tables for programs, data areas and control block structures; and altering memory content or registers, the vendor said. In addition, the package features Find and Help commands.

DBC was designed to facilitate the devel-

(Continued on Page 55)

Xerox Software Now on IBM Gear

LOS ANGELES — A licensing plan to make its applications, system and communications software available for use on in-house IBM and plug-compatible computer systems was announced here by Xerox Computer Services.

The software, previously offered only as part of the company's on-line computer services, can now be acquired for a one-time licensing fee. Under the plan, on-line users of Xerox software can convert total operation of the software to in-house systems.

New customers reportedly will have the option of using Xerox on-line services, installing the software on their own computers, or initially using remote services and then moving the processing in-house at a later date.

Twenty-three integrated applications are available under the licensing plan, includ-

(Continued on Page 55)

'Score' Updated For Data Base Use

NEW YORK — An enhancement of its Cobol program generator which is said to generate on-line code and to interface with data base structures was introduced here by SDA.

Based on its current program generator, Score, Super Score can generate code for on-line applications, interface with data base structures and facilitate the creation and implementation of Cobol programs, SDA said.

Super Score will also support data communications screen mapping facilities. The software package is available for CICS, Intercomm and other teleprocessing systems utilizing IMS or other major data base management structures.

Super Score is priced at $105,000 and includes education, documentation, instal-

(Continued on Page 55)

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- MSM can be installed in **10 MINUTES** — NO IPL is required.
- Requires **NO SYSTEM MODIFICATION** whatsoever.
- Additional overhead caused by MSM is INSIGNIFICANT.
- MSM is now being used in well over 100 installations throughout the world.

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- **Provides powerful operator commands** to Control and Monitor performance and activity.
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- **Is independent of system environment—** for example, it works equally well with MVS, MVS-SE, SVS, MVT, VS1, MFT, HASP, ASP, JES2, JES3, etc.
- Can be installed in **10 minutes** without an IPL and with **NO SYSTEM CHANGES** whatsoever.
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GCD Global Console Director

The Global Console Director is an extremely flexible tool. It allows (selected message streams from different systems to be logically "blended" to create a **unified system image** to whatever degree desired). In a slightly different vein, GCD allows **any** console on any system to be logically attached concurrently (and perhaps in different ways) to any set of systems in your complex!

GCD allows commands entered from any console to be directed and processed anywhere in the complex; in this respect, all consoles are effectively linked to all systems. In almost every aspect, GCD is philosophically and operationally compatible with the standard system console support.

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Debugging Tool Offered For Assembler Work

(Continued from Page 53)
opment and maintenance of a wide variety of system and applications-oriented programs ranging from Time Sharing Option (TSO) command processors to authorized subsystems, data base managers and network communicators.

It can be used with either batch or TSO programs for IBM 370/158, 370/168, 30 series, 3081 and 4300 computers. The vendor said DBC can be used to debug MVS system components such as JES2, JES3, Tcam, Vtam and IMS.

Cost of the package, including a computer tape with 40,000 lines of code and three documentation manuals, is $4,000 for a paid-up license or $245/mo.

Maintenance is optional at $40/mo.

The vendor is located at 195 W. Main St., P.O. Box 45, Avon, Conn. 06001.

Xerox Plan For IBM User

(Continued from Page 53)
ing software developed for the manufacturing, distribution and public service industries, as well as for the financial community.

For OS/VS1

The Xerox software was designed to operate as a single task of IBM operating system OS/VS1 on a variety of IBM equipment, including the 370, 30 series and 4300 series. Users with IBM-plug-compatible systems, such as Amdahl Corp., Magnuson Computer Systems Corp., Control Data Corp.'s and National Advanced Systems machines, can also use the software, the vendor said.

The minimum system requirement is an IBM 4331 with 1M byte of main memory, 700M bytes of disk memory, a printer, system console and tape drive for backup. Local and remote users can have access to the system through IBM 3270 terminals and/or Xerox 1350, 1340 or 1330 workstations.

The software license is priced on a per application basis, with discounts available for multiple application usage. Depending on the applications selected, the software license fee ranges from $150,000 to $350,000.

The vendor is located at 5310 Beethoven St., Los Angeles, Calif. 90066.

SDA Adds 'Super Score'

(Continued from Page 53)
lation and up to two months of on-site vendor support. Present Score users on the maintenance program can acquire Super Score at no charge. For nonmaintenance subscribers of Score, special terms are available.

SDA is located at 26th Floor, 475 Park Ave. S., New York, N.Y. 10016.

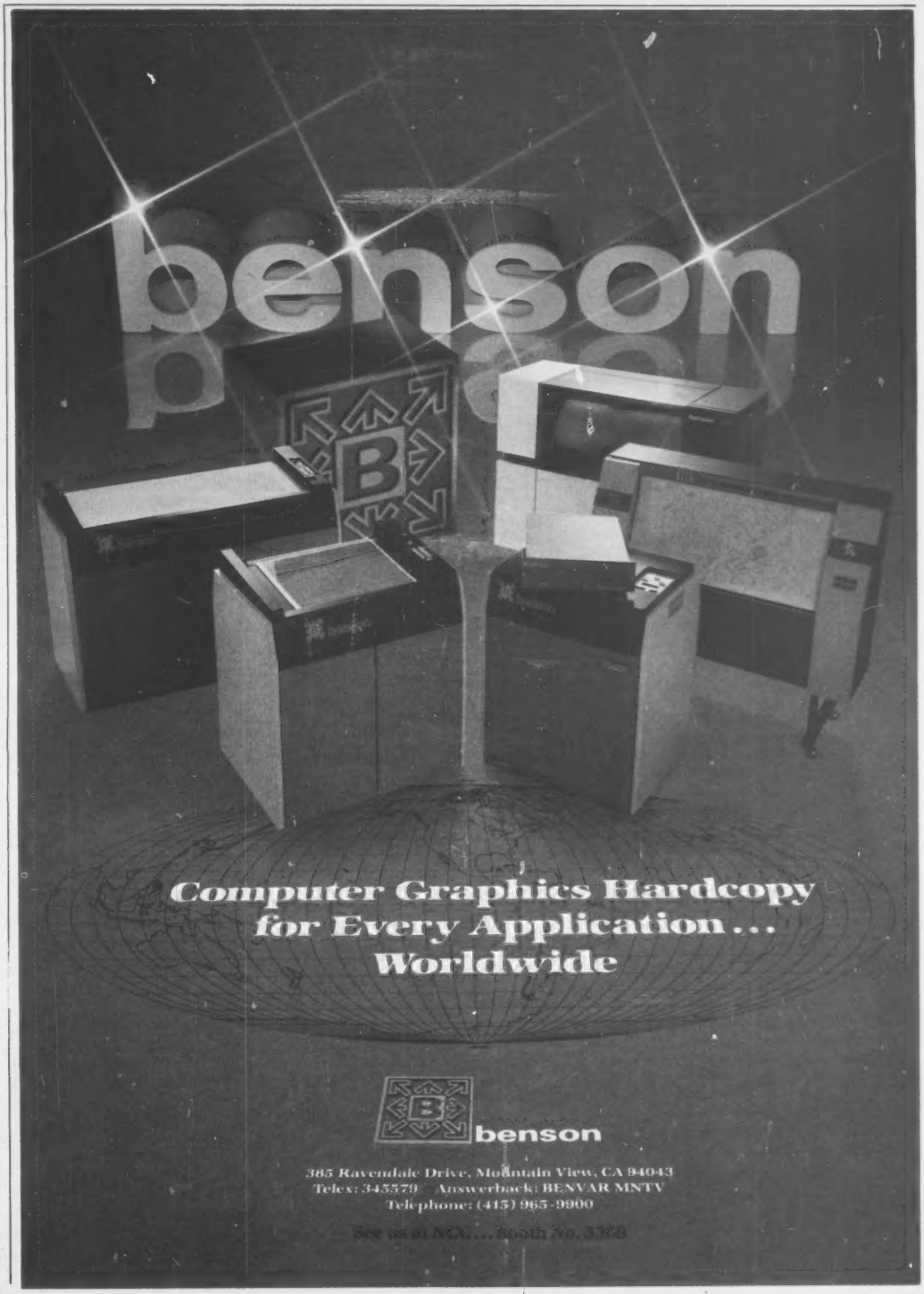
Transaction Monitor Fits NCR Gear

CINCINNATI — Cincom Systems, Inc. here announced an on-line transaction processing monitor for NCR Corp. computer users which it claims allows them to develop and implement on-line interactive application systems without any knowledge of communications or terminals.

The T-Com system was designed for the NCR 8000 series of computers using the VRX operating system. It employs reentrant program logic, multiple thread management and modular programming to monitor and control multiple user tasks and multiple terminal operations.

Major components of T-Com include a network management system which enables information about terminal users and network security to be entered and maintained on-line; network security which monitors and controls access to the network outside the application programs; and run-time control including input control, error control and console control.

For a limited time, T-Com is available at the introductory price of $9,500, the vendor said from 2300 Montana Ave., Cincinnati, Ohio 45211.



Don't let TSO buying a



VAM/SPF will get more out of the computer you already have

VAM/SPF is the software breakthrough that speeds system response and cuts TSO overhead by actually correcting IBM's timesharing architecture.

VAM/SPF's bottom-line payoff is the time and money you save by keeping your present system. You also reap the continuing benefits of a more cost-efficient and responsive data center.

Increased application programmer productivity

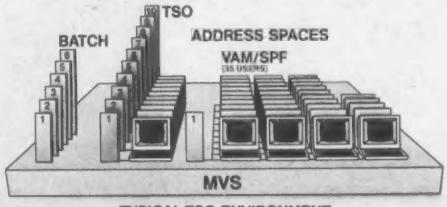
SPF is the most easily understood and widely used interactive programming tool available today. However, the high TSO overhead associated with SPF diminishes its benefits. Running SPF under VAM frees systems resources, provides faster terminal response time, and translates directly into getting more work done.

More resources for systems programming

Not only do your applications programmers take up less of the system, but VAM/SPF gives the systems programmers more of TSO when they need it.

Better overall system response

Now that TSO no longer takes up a disproportionate share of the computer, all your on-line and batch jobs can run faster. Because up to 35 SPF users fit into a single VAM address space, you'll have a lot more TSO resources ready to respond without usurping the rest of the system.



TYPICAL TSO ENVIRONMENT

VAM/SPF is the architectural solution

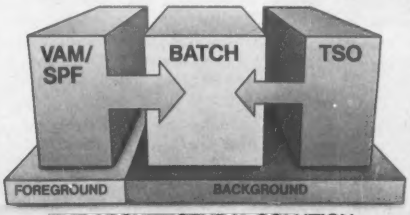
IBM designed SPF to run under TSO, which gives equal attention to both trivial edit-and-submit tasks as

crowd you into bigger CPU



well as to more resource-hungry work. This makes TSO a real resource eater and slows response time for every user of the system.

Boole & Babbage has taken this IBM architecture and turned it into the ideal timesharing system with the classic foreground/background approach. We simply took SPF functions out of TSO and put them under their own communication monitor,



THE ARCHITECTURAL SOLUTION

VAM (VTAM Application Monitor). By forcing the edit-and-submit work to be done under VAM as a classic foreground activity, VAM provides SPF users with truly interactive response time. Background activities such as compiles and on-line testing remain under TSO.

Install VAM/SPF today, start running it tomorrow

VAM requires no programmer retraining because, unlike other programmer productivity tools, there is no other language involved. In fact, VAM is transparent to the SPF user. And VAM is installed using standard SMP procedures.

Get the full story from a VAM/SPF user

VAM is producing bottom-line savings today at data centers across North America. Contact Boole & Babbage for more information and a copy of the Performance Comparison of VAM/SPF vs. TSO/SPF. Just call 800-538-1872 Ext. 527 TOLL FREE (in California call 408-735-9550), or write Boole & Babbage, 510 Oakmead Parkway, Sunnyvale, Ca. 94086.

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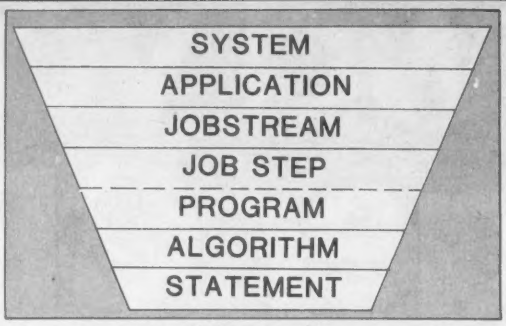
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Bottom-Up Test Method Advised Over Top-Down

(Continued from Page 53)

of failure) and proceeds to debug and retest that level. Testing continues back up through levels until the highest level is reached and tests out correctly. The test is then complete.

A walk-through the top-down test flow based on the assumption that the highest level affected by a change is the jobstream would probably mean running the jobstream to test for syntax errors and continuity. If the job ran to completion without halts and the output appeared to be reasonable, the person in charge would probably stop testing without independently checking the lower levels of software — TEST OK, HIGHEST LEVEL, STOP.



Software Layers

If the output was not reasonable or there were halts during the run — TEST NOT OK — the programmer would have to determine the cause of the problem. He could drop directly to the statement level and work his way back up, but this is not general practice.

The tendency is to proceed down to the next lower level — the job step or program — and test it. If no errors are found by running the job step or procedure, the programmer would go back to the jobstream and search for the error at that point. Since the job step worked, every level beneath it is assumed to be correct.

But if errors are found at the job step or program level, the testing process would continue — TEST NOT OK, REDUCE LEVEL BY 1, TEST AGAIN — until a level is performed without error.

At this point, the lowest successful software level has been found and the next higher level is assumed to be in error — TEST OK, INCREASE LEVEL BY 1, DEBUG, RETEST. When that level is debugged, the next higher level is tested. This process continues through the highest software level at which point the test is complete.

If success is not achieved on the first test, top-down testing is a complicated procedure. And keep in mind that success is based on an assumption about the reliability of the lower software levels.

The bottom-up method means beginning the test at the level in which the change was implemented. This level is tested until it performs correctly. The tester then proceeds to the next level and tests it until everything checks out. This goes on until the highest affected level has been reached and the test is considered complete.

No Assumptio ꞌ

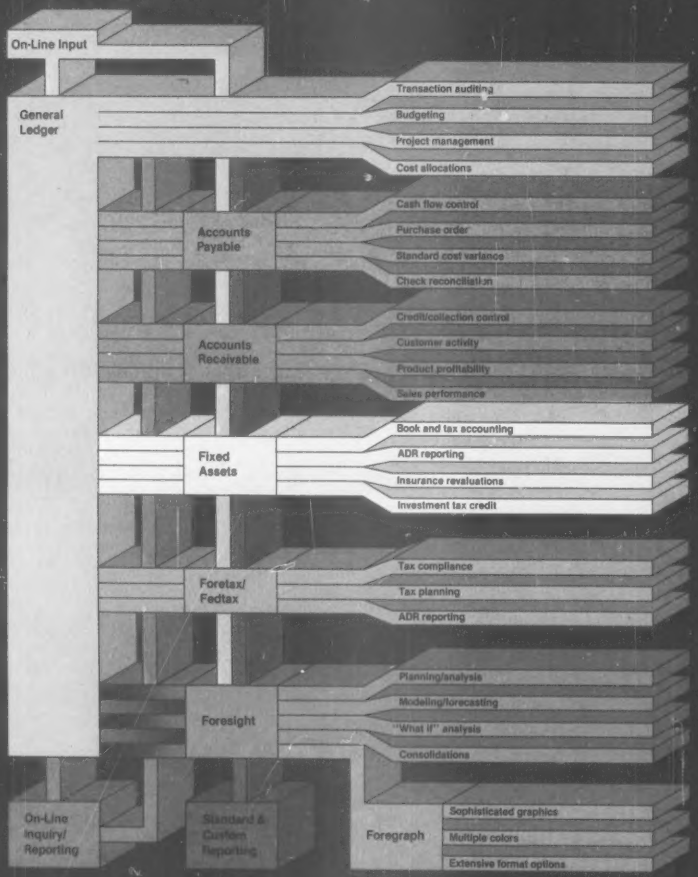
The bottom-up approach makes no assumptions about the performance o‹ a software level. If a change to an algorithm updates a file used at some other point in the jobstream, all levels up through the jobstream are tested. If that jobstream affects an application by altering data used in some other jobstream, the application level is tested. If the application interfaces with other applications within the system, the system level is also checked out.

Unlike the top-down approach, no assumptions are made about a level's functionality without testing that level. The bottom-up method also provides a double check of the lower levels since the testing of each level forces the function of its component levels. Running a test on the program level also re-

(Continued on Page 59)

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For CICS/VS Shops

DL/1 Interfaced to 'Trans IV' 3.0

CANOGA PARK, Calif. — Informatics, Inc. here announced availability of a DL/1 interface to Trans IV, the interactive application development system for IBM CICS/VS installations.

The interface will be available concurrent with the availability of Release 3.0 of Trans IV in May 1981. Release 3.0 also will contain new features such as automatic key cocatenation and expanded cursor control capabilities.

Trans IV reportedly is a completely interactive approach to developing on-line applications under CICS/VS. Features include formatted display screen definitions, integrated procedures, formatted file definitions, file browsing, report viewing, interactive testing and debugging and a DL/1 interface.

The Trans IV DL/1 interface is priced at $5,000, the vendor said from 21050 Vanowen St., Canoga Park, Calif. 91304.

Bottom Up More Precise

(Continued from Page 58)

tests the algorithm level and the statement level under different conditions.

Therefore, the bottom-up approach is much more precise than top-down testing — a fact that becomes apparent when a job fails at a lower level while in production.

In order to implement either method, test data is an obvious necessity. The need for an efficient method of creating and utilizing that test data is not so obvious.

Not Advised

Test data is often created by generating copies of production data files. With the exception of parallel tests, using copies of live data for software tests is not recommended for two reasons.

One is that the copies are made from files which are usually free of invalid data. This does not allow a full test for unusual or invalid cases. Second, copies of product files usually mean passing more common data through the software than necessary. Software does not fail when it handles the same data many times. It fails because it cannot handle certain types of situations.

The solution is to develop a set of files that simulate rather than duplicate production data and also include provisions for testing invalid data or unusual conditions. A test file that contains only enough records to ascertain the reliability of the software is created for each production file.

Once the test files have been created, they should be permanently stored on some type of off-line media. This allows the programmer to reuse the file in future tests and save on-line storage space. It also protects the file from accidental destruction.

Test files must be thoroughly documented and tested to assure effectiveness during the software test process. It is futile to create a set of test files which can generate unpredictable results. Finally, expected results from test-file processing should also be documented for future reference and test-run comparison.

Grilz is a systems analyst with Kroy Industries, Inc.

Wang VS Gains Retrieval

ARLINGTON, Va. — Information Management Consultants, Inc. has announced an asset management and keyword retrieval package for Wang Laboratories, Inc. VS systems.

Called the System for Asset Management, the package features depreciation calculations, investment tax credit capabilities and several standard reports. The package costs $1,500, the vendor said.

The Keyword Retrieval Information System features entry and maintenance of authors, source, date, title and abstract information. It also includes menu drives design and up to 90 keywords for each abstract. It costs $3,500, the vendor said from 1008 N. Randolph St., Arlington, Va. 22201.

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For Honeywell: Phoenix single disk cartridges, 80 and 300 MB storage modules, 100 MB packs.
For IBM: 100 and 200 MB 12-high packs, top and front-load single disk cartridges.
For Wang: Phoenix single disk cartridges, 80 and 300 MB storage modules, top-load single disk cartridges.

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CW-427

What's Your Line?

"Life With the Phone Company" will be the theme of a *Computerworld* Special Report on data communications networks appearing in June.

The report will feature tutorial essays and applications stories that indicate useful strategies for planning and managing data communications networks.

Suggested topics for contributions include:

- How to minimize operating costs of private-line networks.
- How to anticipate the user impacts of regulatory actions.
- How to know when to acquire faster equipment "as the Bell tolls."
- How to evaluate alternatives to common carrier services.
- How phone companies will affect the packet-switching arena.

If you have something to contribute to the Special Report, please send by May 8 a manuscript no longer than six double-spaced typewritten pages to Senior Editor Brad Schultz, Network Special Report, *Computerworld*, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Artwork, charts and photographs for the report, which is slated to run in CW's June 29 issue, are also welcome.

Users May Reap Benefits From NSF Network Project

By Brad Schultz
CW Staff

MADISON, Wis. — Most network users want easy links between different brands of equipment. Academic computer science programs may die without such "open systems interconnection," which is why commercial users and the vendors serving them may benefit in spades from a National Science Foundation (NSF) project now led from the University of Wisconsin here.

NSF has allocated $4.96 million to a team of university computer scientists for development of a Computer Science Research Network (CSNet) that would allow academic researchers across the nation to access each other's systems. Serving as a thoroughfare for both data and words, CSNet is intended to help many educational institutions cope with obsolescent and inadequate computational facilities [CW, April 6].

Analysis

Poor facilities and the salary differential between academic and industrial computer scientists is blamed for a serious shortage in the nation's supply of computer science professors at a time when enrollments in university computer science courses are soaring. Computer scientists have been migrating in droves from campuses to industrial research centers.

Notwithstanding its official purpose, work on CSNet probably cannot avoid solving major problems commercial DP users have in arranging cost-effective and efficient data channels among equipment from different vendors. It is easy to compare the CSNet project with the work that culminated in Arpanet, officially a Defense Department facility, but functionally an important way for academic and industrial research scientists to collaborate from dispersed sites.

(Continued on Page 62)

Terminal Emulates DEC Equipment



Cobar Model 3132

ANAHEIM, Calif. — A Digital Equipment Corp.-compatible video terminal for users of DEC VT132, VT100 and VT52 terminals is available from Cobar, Inc.

The Model 3132 provides functional emulation of all three of the DEC terminals together with matching size, similar case design and detachable DEC-oriented keyboard.

Standard features include a nonglare screen, numeric/special function keypad and VT132 word processing-oriented features like text editing by character or line, protected data fields and block or interactive data transfers.

The single unit price is $1,795, the vendor said from 1181 N. Fountain Way, Anaheim, Calif. 92806.

Venture Formed For Coax Products

SUNNYVALE, Calif. — Prentice Corp. has announced a joint venture with the Catel Division of United Scientific Corp. to produce a line of coaxial data communications products.

A high-speed coaxial data modem is the first coaxial communications product the two firms will manufacture and market together.

Designated the Coax Modem, the product will combine separate RF and data component packages in one module.

The forthcoming modem can run data at a number of speeds between 2,400 bit/sec and 28.8K bit/sec, spread 200 KHz apart in the 4 MHz range of frequencies.

Available in June, the modem will cost $18,905, the vendor said from 266 Caspian Drive, Sunnyvale, Calif. 94086.

Dataspeed 40 Gets Split Buffer Option

CHERRY HILL, N.J. — RCA Service Co. has added a split buffer option to its Dataspeed Model 40 CRT terminal emulator which reportedly allows simultaneous preparation of outgoing messages and receipt of incoming messages.

The option was designed for Teletype Corp. Model 33 and 35 users who operate on multipoint private-line 8Al store-and-forward communications systems.

The communications CRT terminal improves operating efficiency through easier message preparation and reduces errors, a spokesman said.

The Model 40 emulators range in price from $139 to $325, the vendor said from Cherry Hill, N.J. 08358.

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Multiplexer Allows Alternate Routing

ROCHELLE PARK, N.J. — Timeplex, Inc. has introduced a 48-channel statistical multiplexer said to allow alternate routing between multiple data links.

Joining the vendor's Series II Microplexer family, the M4828 statistical multiplexer allows the operator to select from two routing tables stored in memory to find alternate data paths when a link fails.

The alternate routing feature provides the operator with the capability to select from two routing tables stored in the memory of the Microplexer. If a link fails, the system can be brought up immediately, the vendor claimed.

In a typical application, an M4828 in City A may normally communicate with M24 Microplexer units in Cities B and C, in a loop configuration, with a backup link between Cities B and C.

Should the link between A and either B or C go down, alternate routing would permit communication with A through the remaining link, a spokesman said.

The price for the unit with four channels is $5,150, the vendor said from One Communications Plaza, Rochelle Park, N.J. 07662.

Giltronix Unveils Switches, Network Control Systems

PALO ALTO, Calif. — Giltronix, Inc. has unveiled terminal switches, network control systems, a general-purpose controller board and a remote-control switching unit.

The family of terminal switches is fully compatible with equipment from Wang Laboratories, Inc., Hewlett-Packard Co., IBM and Digital Equipment Corp., the vendor claimed.

The basic unit costs $139.

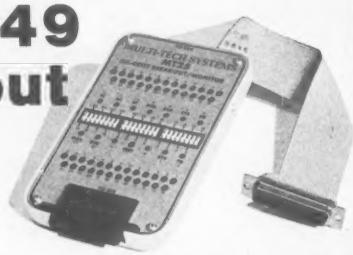
The General Purpose Controller Board is a self-contained microcomputer with CPU, read-only memory , random-access memory and I/O.

Besides general-purpose applications, it is also suited for communications applications, a spokesman said. It costs $599.

The GRS-S8RC remote-control switching unit features remote connection of up to three peripheral devices to a CPU or modem, communication speeds of up to 1M byte/sec and bidirectional operation (three CPUs can select a common device).

The price is $289 for a single unit, the vendor said from Suite 44, 450 San Antonio Road, Palo Alto, Calif. 94306.

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Users May Reap Benefits

(Continued from Page 61)

Arpanet was the first packet-switched network. Its creation revolutionized data communications and led to the birth or significant expansion of several companies on which many DP users presently depend for data communications.

CSNet will feature gateways to Tymnet and Telenet, packet-switched networks offered by two such companies, as well as Arpanet, which is commonly available to professors and graduate students doing research under Defense Department grants or contracts.

Link to Phononet

CSNet will also latch to Phonenet, a telephone-based message relay system developed by University of Delaware professor David J. Farber, a prolific contributor to local network technology. Many leading data communications researchers like Farber have committed themselves to the five-year CSNet project.

Their work may have special meaning for customers of Digital Equipment Corp. because DEC is the leading systems supplier to U.S. educational institutions, where much software for CSNet will be written and tested. However, Bolt Beranek & Newman, Inc. (BBN) — a prime contractor on the Arpanet project years ago — will play a major role in development of CSNet, implementing a number of important protocols for internet, host-to-host communications.

Foremost Collaboration

What may shape up as the world's foremost collaborative research and development venture in open systems interconnection will feature much exercise of software licensed by AT&T at a time when demand for that software is reportedly building fast in the commercial DP marketplace [CW, Feb. 23].

The BBN division likely to develop internet protocols for CSNet has named Bell Laboratories' Unix as its standard operating system and Bell Labs' C as its standard programming language.

According to the CSNet proposal filed with NSF, developers also plan heavy implementation of the X.25 proposed standard for layer three of the International Standards Organization's (ISO) open systems interconnection reference model.

Source of Controversy

X.25 entails application of the High-Level Data Link Control (HDLC) ISO protocol, which is a superset of IBM's Synchronous Data Link Control and reportedly a source of controversy among those piecing together a standard local network architecture for the Institute of Electrical and Electronics Engineers.

As academic and industrial researchers rally to save university computer science departments, commercial users may find CSNet suggestive of alternatives to the IBM philosophy on data communications, which so far scorns X.25 domestically and — through the Systems Network Architecture — does not grant much in the way of open systems interconnection. And CSNet cannot fail to produce important new extensions of DEC systems capabilities in distributed data base environments.

For more information on CSNet, contact the project's leader, Prof. Lawrence H. Landweber, at the Department of Computer Sciences, University of Wisconsin-Madison, 1210 W. Dayton St., Madison, Wisc. 53706.

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Lots of people can sell or lease you terminals. But no one can give you terminals that come with the expert technical advice, total support and guaranteed immediate delivery that ours come with.

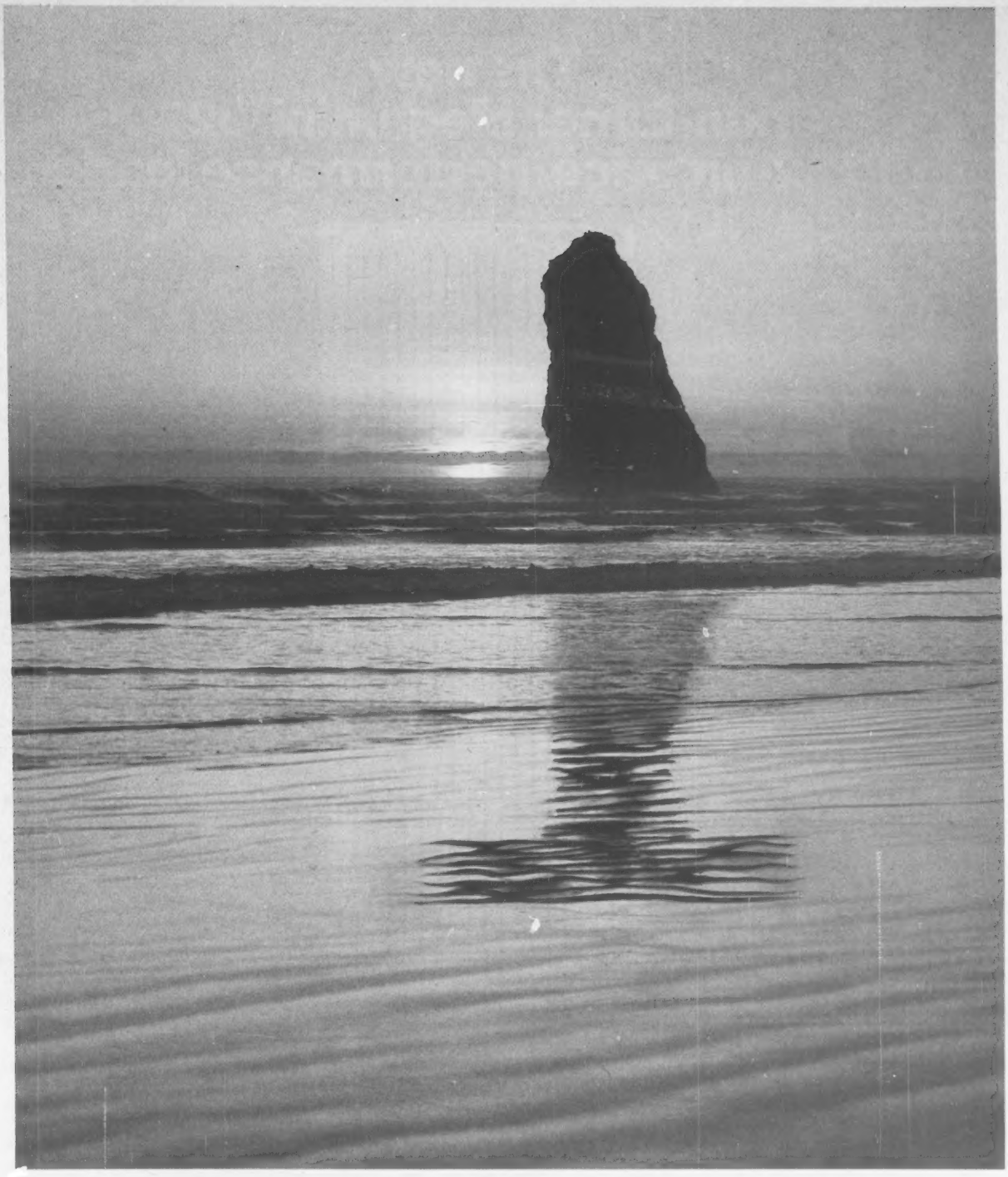
So what's it going to be? A terminal from a company that delivers what it promises. Or a terminal from a company that just makes a lot of promises.

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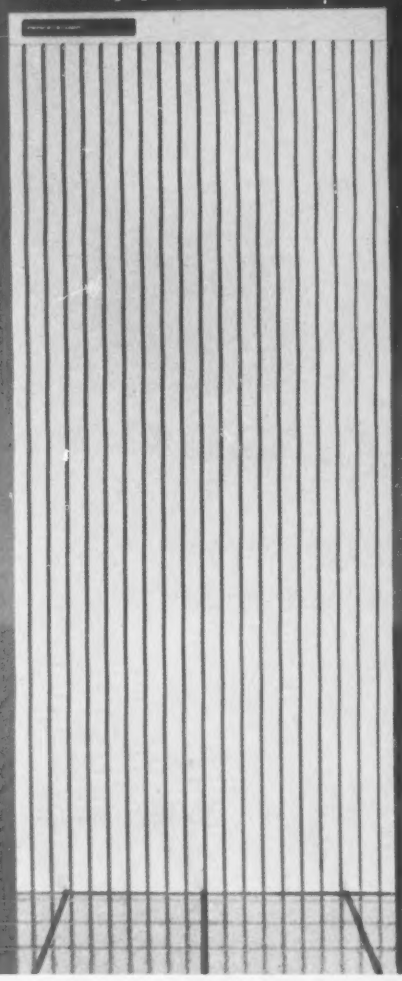
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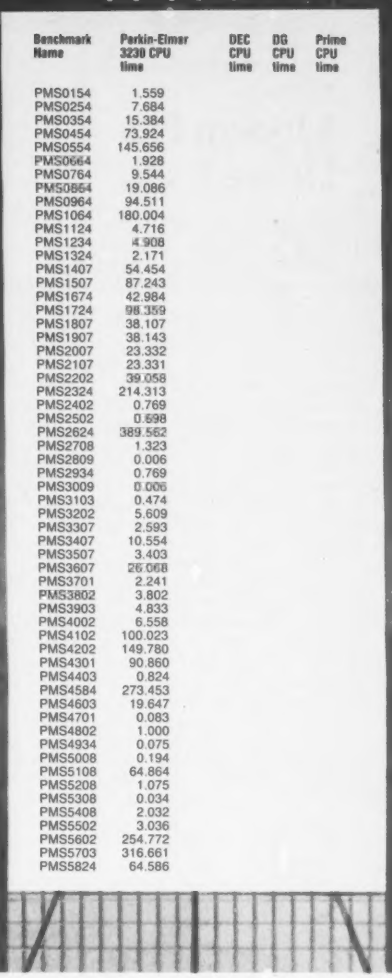
- □ Up to 8MB of directly addressable high-density MOS ECC memory.
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- □ The industry-leading globally optimizing FORTRAN VII.
- □ Reliance, high-performance software package for commercial transaction processing.
- □ Many more standard and optional features that are available now—not a year from now.

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The Perkin-Elmer 3230 comes with a wide repertoire of field-proven Megaware system software.

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Meet the new champ at the NCC Show Booth 726.

We challenge any machine to beat the 3230 dollar for dollar, benchmark to benchmark.



Benchmark Name	Perkin-Elmer 3230 CPU time	DEC CPU time	DG CPU time	Prime CPU time
PMS0154	1.559			
PMS0254	7.684			
PMS0354	15.384			
PMS0454	73.924			
PMS0554	145.656			
PMS0664	1.928			
PMS0764	9.544			
PMS0864	19.086			
PMS0964	94.511			
PMS1064	180.004			
PMS1124	4.716			
PMS1234	4.908			
PMS1324	2.171			
PMS1407	54.454			
PMS1507	87.243			
PMS1674	42.984			
PMS1724	98.359			
PMS1807	38.107			
PMS1907	38.143			
PMS2007	23.332			
PMS2107	23.331			
PMS2202	39.058			
PMS2324	214.313			
PMS2402	0.769			
PMS2502	0.698			
PMS2624	389.562			
PMS2708	1.323			
PMS2809	0.006			
PMS2934	0.769			
PMS3009	0.006			
PMS3103	0.474			
PMS3202	5.609			
PMS3307	2.593			
PMS3407	10.554			
PMS3507	3.403			
PMS3607	26.068			
PMS3701	2.241			
PMS3802	3.802			
PMS3903	4.833			
PMS4002	6.558			
PMS4102	100.023			
PMS4202	149.780			
PMS4301	90.860			
PMS4403	0.824			
PMS4584	273.453			
PMS4603	19.647			
PMS4701	0.083			
PMS4802	1.000			
PMS4934	0.075			
PMS5008	0.194			
PMS5108	64.864			
PMS5208	1.075			
PMS5308	0.034			
PMS5408	2.032			
PMS5502	3.036			
PMS5602	254.772			
PMS5703	316.661			
PMS5824	64.586			

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If challenging applications are making you hungry for power, let us show you how the 3230 would handle them. Send us a set of benchmarks which typify your jobs and we'll run them on our 3230. We're confident the results will run your present system out of town.

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Modem Runs at 2,400 Bit/Sec

SUNNYVALE, Calif. — Prentice Corp. has unveiled a synchronous, 2,400 bit/sec private-line/dial-up modem and an automatic dialing interface that reportedly allows data terminal equipment to do pulse dialing on a switched network.

The P-201C modem is compatible with Bell's 201B and C data sets, the vendor claimed.

It offers full duplex and can operate on unconditioned 3002-type lines or be directly connected to the Direct Distance Dial network, a spokesman said.

The $950 modem has a microprocessor-based design and is available in fixed loss loop, permissive or programmable modes. On-board ring detect and answer-back circuitry provide for fully automatic data transfers from remote sites, he said.

The P-701 auto-dialing interface is FCC-registered for direct connection to the dial network.

The $175 device allows a CPU or intelligent terminal to establish dial-up links without a telephone set or other external equipment, the spokesman said.

Prentice is at 266 Caspian Drive, Sunnyvale, Calif. 94086.

Modem Fits Home Use

MIAMI — A 300 bit/sec modem for the personal computer and terminal markets has been announced by Lexicon Corp.

The LEX-12 is said to be the first modem that allows direct coupling at the telephone handset jack, direct coupling to the phone line (through the LEX-14 wall adapter) or acoustic coupling through the telephone handset. When the LEX-12 is direct-coupled, TALK or DATA operation is switch-selectable.

The LEX-12 can communicate with the LEX-11 acoustically coupled modem or any Bell 100 series-compatible modem, as well as with any other LEX-12. The unit may be used with a Princess or other phone by adding the LEX-14 wall adapter.

The acoustically coupled, full-duplex modem has switch-selectable originate or answer capability, and features an RS-232 interface. LED indicators display power and ready status.

The unit costs $199 from 8355 Executive Center Drive, Miami, Fla. 33166.

DCD Multiplexer Runs Under X.25 At 19.2K Bit/Sec

MANSFIELD, Mass. — An intelligent concentrator/multiplexer for 24-channel asynchronous communications at up to 19.2K bit/sec under the X.25 proposed interface standard is available from DCD Telecommunications, Inc.

Supporting half- and full-duplex communications, the 5000TC concentrator/multiplexer features a user command language and intelligent echoplex capability. Options include an expanded buffer, data encryption and operation in tandem with another 5000TC.

The $2,500 device also allows choice of packetizing time-outs and supports RS-232C and CCITT V.24 interfaces, DCD Telecommunications said from 160-162 N. Main St., Mansfield, Mass. 02048.

Qwint Offers Three Printer Units

NORTHBROOK, Ill. — Qwint Systems, Inc. has announced a printing terminal, teleprinter with modem and a receive-only peripheral printer as extensions of its microcomputer systems.

The KSR-743 printing terminal may be configured from the keyboard for bit/sec rate, data pacing, disconnect and 20-char. answer-back and features RS-232 and current-loop interfaces as standards, the vendor claimed.

The KSR-744 teleprinter with modem supports all 743 terminal features and has an internal modem intended for direct connection to the telephone line via a modular jack, the company said. The RO-743 is a receive-only printer intended as a computer or CRT terminal peripheral, the company said.

The KSR-743 is priced at $995, the KSR-744 at $1,195 and the RO-743 at $795 from Qwint Systems, Inc., 3693 Commercial Ave., Northbrook, Ill. 60062.

Two Ven-Tel Modems Offer Bell 103J-Compatibility

SANTA CLARA, Calif. — Ven-Tel, Inc. is offering two Bell 103J-compatible modems.

The MD103J-1 offers originate auto-answer and internal direct-access arrangement. It costs $375.

The 300 Plus (MD103J-3) offers network addressing capability with such features as keyboard dialing, auto-dialing of numbers stored in dynamic memory, repeat dialing and camp-on dialing. It costs $550, the vendor said from 2390 Walsh Ave., Santa Clara, Calif. 95051.

Huber Offers Net Analyzer

MARLTON, N.J. — A data communications analyzer for testing, monitoring and emulating data communications networks is available from Huber Systems Corp.

Monitor II simulates a wide variety of data communications disciplines at rates up to 120K bit/sec and is compatible with asynchronous, synchronous, synchronous data link control and other high-level data link control applications, the vendor spokesman said.

The product has a "one-button, autoprogram setup" for monitoring and transmitting, a 16K-char. memory (optional 48K-char. available) and a 5-in. diagonal screen with 512-char. display, a spokesman for Huber Systems Corp. claimed.

Monitor II costs $3,795. More information is available from Rt. 73 N., Marlton, N.J. 08053.

Terminal Reductions!

Product	List Price	Reduced Price (Quantities 1-4)
ADM 31	$1,450	$1,355
ADM 324	980	895
Extel AH11	1,845	1,715
GE 2030	1,495	1,475
Tally 1612 KSR	2,680	2,550
Tally 1612 RO	2,755	2,280
Teletype 43 ASR -		
4330-2BCA	2,982	2,680
4330-2ACA	3,017	2,710
Teletype 43 KSR -		
4320 AAK	1,558	1,420
4320 AAL	1,593	1,450
4320 AAH	1,612	1,470
4320 AAJ	1,647	1,500

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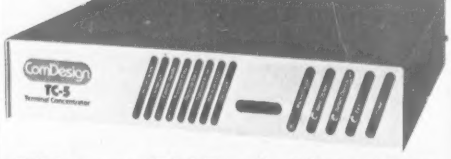
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Keystone of the data center is this NCR Criterion 8575.



Tellers communicate to the center through NCR 2270 terminals.

Bank's DP Center Up in Record Time

Special to CW

ALBANY, N.Y. — How does a bank that grew in one decade from a $300-million, three-office operation to a nearly $1.3-billion, 21-office institution handle its data processing needs?

It sets up its own personal DP center, of course. In this case, however, the Albany Savings Bank (ASB) switched from a service bureau to a complete 110-terminal computer operation in a record five-and-a-half months.

Since 1970, the ASB has merged with five different banks. It is now the largest bank from New York City to Buffalo and plans to become a $2 billion institution by 1985.

As the bank grew, its management performed a yearly evaluation of the service bureau and compared its performance with the possibility of bringing all of the DP operations home. It was not until just last year, however, that the bank could really justify its own computer center.

"We were satisfied with the day-to-day operation of the service bureau that was doing our processing," recalled Vincent H. Crawford, chairman of the board of trustees and the bank's chief executive officer. But "its biggest drawback was the lack of a central information file. We wanted that for five years or more, but their system just didn't permit it."

When the most recent DP study indicated that an in-house computer would be the best route, the bank originally opted for a two-year planning and installation cycle.

However, negotiations with the service bureau crumbled and management was forced to start implementation immediately. This created a time problem, since only five-and-a-half months remained on the service bureau's contract.

The computer center had to be planned, built, staffed and operational before the service bureau pulled out the computer rug.

ASB immediately installed an NCR Corp. Criterion 8575 computer with 2M bytes of memory. Software supplied was the Criterion Loan and Savings System (Class), modified by Astradyne Computer Industries, Inc. of Garden City, N.Y. The bank chose NCR as a vendor because it had been using NCR terminals for a number of years and accomplished the first major installation of the Model 2270 terminals in September 1979.

The computer was ordered on Feb. 21, 1980 and delivered less than two months later.

Front-End Mini

To handle the vast amount of communications, the bank uses a front-end minicomputer that monitors the communications lines.

"We are dependent on several different vendors and telephone companies, and if we couldn't immediately track down problems, there would be a lot of finger pointing and not much action," Barry G. Blenis, vice-president of systems and procedures, explained. "Now we can capture problems on tape and play them back to the people involved."

Staffing the center was as important as building it, observed Peter McLetchie, the bank's DP manager. Although local people with batch processing experience were available, the center would be operating in an on-line real-time atmosphere. The bank managed to find the right people by advertising in the employee newspaper and hiring from within.

Things began to fall in place about June 7, when data from some 25,000 loans was converted to the new system. But the big conversion came on the Fourth of July weekend when, McLetchie noted, 52,000 checking accounts and 300,000 savings accounts were converted in less than three days.

"We ran a test conversion first in modules, and then 100% several times before the actual conversion took place," he added. "On the weekend of the live conversion, the conversion programs, sorts, and merges ran smoothly and as planned. Our new master files were created and ready to go on-line Monday morning when the first branch opened."

Although the center does not yet have a complete central information file, it does have an NCR 6780 check sorter, thought to be the first installed at a thrift institution. It also provides the timeliness that could not be had under the service bureau's wing.

"We can write a program, run it tonight, and have the report ready tomorrow," Vice-President Blenis claimed.



This Spectron front-end minicomputer monitors a communications network of 110 terminals in 21 remote locations.

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For DP, Printing Applications

Honeywell Enhances PPS II

WALTHAM, Mass. — Honeywell, Inc. has enhanced its high-speed nonimpact page processing system, PPS II.

Called the PPS II/E, the unit makes the full power of its system controller, a Level 6 processor, available to the user for data processing applications as well as for printing.

In addition, users can connect word processing diskette readers, impact printers and communications lines to the page processing system to accommodate virtually any remote or on-site processing or printing requirement, the vendor said.

The PPS II/E can operate in a centralized environment, supporting on-line or off-line host processors and diskette facilities

Net Configuration

In a network configuration, the system can accept data from remote hosts and minicomputers, as well as from office automation equipment compatible with Honeywell's WP-6 software, the vendor said.

Purchase price for a typical system, consisting of a Level 6 Model 43 controller, an 8,000 line/min nonimpact printer and one stacker is $219,965, with a monthly maintenance charge of $1,314 to cover any 10 consecutive hours of service on any weekday, the vendor said from 200 Smith St., Waltham, Mass. 02154.

Teletype Offers Matrix Printer Based on Micro

SKOKIE, Ill. — Teletype Corp. has unveiled a general-purpose microprocessor-based matrix printer that operates at 340 char./sec in a bidirectional mode.

The AP200 features a choice of Ascii or Ebcdic character sets, character widths and form control. It is designed for use as an auxiliary printer and complements a variety of printer choices already available with the vendor's keyboard display-based terminals.

Other features include form feed, perforation skip-over, soft roll with vertical paper positioning, fast slew rate, front or bottom paper load, snap-in ribbon cartridge and a status display for functions and printer diagnostics.

The product costs $3,868, the vendor said from 5555 Touhy Ave., Skokie, Ill. 60077.

Display Geared To CAD/CAM

PALO ALTO, Calif. — Hewlett-Packard Co. has announced the HP 1351S, a graphics display system for computer-aided design and computer- aided manufacturing (CAD/CAM) applications.

The package consists of an HP Model 1351A graphics generator and an HP 1311B 14-in. direct-beam electrostatic display with tilt stand, the vendor said.

Package costs begin at $10,450 from the vendor at 1501 Page Mill Road, Palo Alto, Calif. 94304.



Bits & Pieces

Policy Insures Systems With $5,000 Coverage

WORCESTER, Mass. — The Hanover Insurance Co. is offering HanoEDP, a computer and data processing insurance policy for equipment, software and recording media.

The policy provides coverage against natural disasters, as well as vandalism. It provides $5,000 coverage to pay for extra operating expenses and has a $100 deductible.

Policies and prices are available through local agents, the vendor said from Worcester, Mass. 01605.

System Covers 99% Of Power Problems

COSTA MESA, Calif. — Energy Power Engineering has announced Powerbloc, a power conditioning system that reportedly provides power protection against 99% of all power-related problems.

The system is a self-contained, portable unit that governs power distribution to all peripherals via flexible cables. Standard models are available in up to 50 KVA, and a system status panel including digital metering and automatic bypass are standard on all models, the vendor said.

Prices start at $24,000, with a typical system costing around $30,000, the vendor said from 3595 Cadillac Ave., Costa Mesa, Calif. 92626.

Power Conditioners Protect Micros, CPUs

BRISTOL, Conn. — Power line conditioners designed to protect computers and microprocessors from such disturbances as high, low or fluctuating voltage as well as transients and noise have been announced by Superior Electric Co.

The Stabiline Computer Regulator will provide a 120V RMS 3% output over an input voltage range of 95- to 130V, according to a company spokesman.

The Regulator also provides 60db common-mode noise rejection to help prevent noise-related problems such as computer errors and loss of information.

Models range in price from $325 to $823; wiring requires simple plug-in connections to the load and the power source. Superior Electric Co. is located at Bristol, Conn. 06010.

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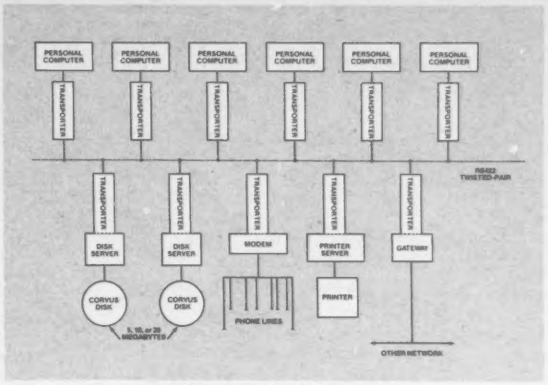
Omninet Links 64 Micros In 4,000-Ft Serial Link

SAN JOSE, Calif. — Corvus Systems, Inc., a two-year-old company that caters to the small computer market, has introduced a high-performance networking device said to allow up to 64 microcomputers and peripherals to be connected in a 4,000-ft serial link.

Omninet is a carrier-sense-multiple-access network that can be used by a variety of microcomputers, including Apple Computer, Inc.'s Apple II and III, Cromemco, Inc. Z-2 systems, Radio Shack's TRS-80 Models I and II and Digital Equipment Corp.'s LSI-11.

The communications system utilizes less expensive shielded twisted pair cable rather than costly and more bulky coaxial cable, a spokesman noted. Omninet's intelligence is centered around a microprocessor-based transporter containing a custom

(Continued on Page 70)



Omninet Local Network

While Saving $20,000/Mo

Minis Keep Furniture Maker on Its Feet

Special to CW

LOS ANGELES — Using a series of minicomputers, a furniture manufacturer here has managed to keep on its feet by keeping millions of people around the world off theirs.

Virco Manufacturing Corp. is a 30-year-old company in the business of providing public seating to churches, schools, restaurants, hotels and convention centers. So if you have just finished a hard day with the kids at Disney World, or gambled your fortune away on Atlantic City's boardwalk, chances are that the chairs you used to rest your weary feet were manufactured and are maintained by Virco.

To help keep track of this extensive network ot seats, and sweep more and more people off their feet, the company uses three Hewlett-Packard Co. 3000 minicomputers that inventory some 50,000 parts needed to compose these chairs.

"The HP 3000s are on the job from the intial order taking to the final shipping of the product," Doug Skoglund, Virco's DP manager, stated. "The computers have reduced the margin of error, helped solve a materials flow problem and are saving . . . about $20,000 a month."

The firm has two public seating divisions located here in Los Angeles and in Conway, Ark. Other divisions include a juvenile furniture outlet, a division that produces plastic-injected molding and another that makes patio furniture. The company even has a manufacturing arm in Sonora, Mexico, that makes wicker-like rattan furniture.

To help maintain this seating empire and the firm's $95 million in sales, Virco obtained its first HP 3000 computer in 1977. The computer, a Series I 3000 model, was installed at the firm's juvenile division to handle payroll, sales orders, general ledger and to smooth out the furniture production process. It eventually worked out so well that one year later Virco installed a second 3000, a Series II, at its North Carolina division.

The following year, an HP 3000 Series III was installed at Virco's headquarters in Los Angeles.

The Series I computer has 128K bytes of memory, a 50M-byte HP 7920 disk drive and a Model 7970 tape drive that is used for backup. Four distributed HP 2640 terminals communicate with the computer via a leased telephone line.

'The computers have reduced the margin of error, helped solve a materials flow problem and are saving . . . about $20,000 a month.'

The Series II in North Carolina has 192K bytes of memory, a 50M-byte disk and an HP 7970 tape drive. Five terminals are linked directly to the computer.

Finally, the Series III at the firm's headquarters has 2M bytes of main memory; three disk drives, each with 120M bytes of memory; and a tape drive used for backup. Fourteen HP 2621P and 28 Model 2640 terminals access the computer directly, while leased lines connect the four warehouse terminals located about four miles away. In addition, three terminals are located at the company's patio furniture area approximately two miles down the road.





Once an order is entered at Virco (left), every department in the corporation has access to it. The computer follows each order from initial sales to final shipping, with user-created software.

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CW/4/27

Mini Bits

Univac Support Programs Offer System 80 Diagnosis

BLUE BELL, Pa. — Sperry Univac announced two support programs designed to help its System 80 users diagnose software and hardware problems, including a service for remote hardware maintenance and a centralized software support facility to help users solve operating software problems.

For software problem diagnosis, users dial the Central Support Facility using a toll-free number to connect with the staff of System 80 professionals, the company said.

Remote maintenance is available through the Remote Support Center, the hub of which is a Remote Maintenance Interface in the workstation controller that is connected to an acoustic coupler, the company said. The service provides a response to customer requests for service and furnishes an accurate remote diagnosis of faults, the company claimed from Blue Bell, Pa. 19422.

Module Directly Executes UCSD Pascal III.0 P-Code

SAN DIEGO — A 16-bit, stack-oriented computer system reportedly featuring direct execution of UCSD Pascal Version III.0 P-code is available from Advanced Digital Products, Inc.

Onminet Ties Up to 64 MPUs

(Continued from Page 69)

gate array and a number of associated support components.

The transporter interfaces directly to the microcomputer or peripheral on any network node and reportedly allows transfer of error-free, variable-length messages without the need for any software intervention by the sending or receiving microcomputer. Since the heart of the system is a built-in intelligent controller, total network management is achieved without a separate and costly network control processor, according to the vendor.

Modular Firmware

The controller firmware is modular in nature and can be updated to accommodate virtually any vendor's microcomputer by the addition of a printed circuit board and some driver software.

In addition, the network's twisted pair data link does not require expensive isolation circuits mandated by other networks, the spokesman claimed.

Omninet works with the firm's Constellation networking software, introduced in March 1980 as part of a back-end network, which provides up to 80M bytes of shared storage, multilevel file security and spooled peripherals. The Constellation software is oriented toward Pascal, but provides varying levels of support to native operating systems, CP/M and Oasis.

NCC Display

Omninet will be shown for the first time next week at the National Computer Conference. Besides interfacing to a variety of microcomputers, the system can also be linked to the firm's 5M-, 10M-, and 20M-byte Winchester disks, its Mirror video cassette storage backup system, and the Constellation network.

Future plans include providing gateways to Ethernet, Systems Network Architecture (SNA) and other available networking structures by 1982, the spokesman explained.

The system costs $495 for the Apple and S-100 bus computers and $750 for the DEC LSI-11. A disk server, necessary to connect the system to the firm's Winchester disks, costs an additional $990.

Corvus is located at 2029 O'Toole Ave., San Jose, Calif. 95131.

The PDQ-3 incorporates the Q-Bus, which permits the addition of a wide variety of peripherals, including Winchesters and 80M-byte to 300M-byte Control Data Corp. disk drives, a spokesman noted.

The CPU module also features a real-time clock interval timer, multiplexed CRT terminal and serial printer interface, DMA floppy disk controller and bootstrap loader from floppy or hard disk.

The price for the system is $6,995, the vendor said from 7534 Trade St., San Diego, Calif. 92121.

Line Printer for Series/1 Provides Diagnostics

SAN DIEGO — A line printer controller designed for the IBM Series/1 minicomputer and said to provide broad diagnostic capabilities is available from Datasystems.

The DLP-3300 is a single printed circuit board that provides direct memory access interfacing between the Series/1 and printers and uses its on-board microprocessor capability to provide an external self-test, the company said.

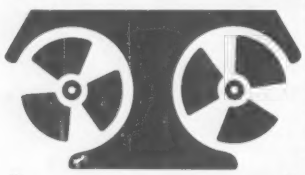
The DLP-3300 is available from stock within two weeks and is priced at $1,825, Datasystems said from 8716 Production Ave., San Diego, Calif. 92121.

Group Offers Insurance Against WP, Mini Losses

MORRISTOWN, N.J. — The U.S. Insurance Group is offering insurance against loss of minicomputers and word processing (WP) equipment used in an office or retail setting and requiring no special environment.

The Minicomputer/Word Processor policy features a flat dollar limit on automatic coverages.

Policy price depends on the user's equipment configuration, U.S. Insurance Group said from 395 Madison Ave., Morristown, N.J. 07960.



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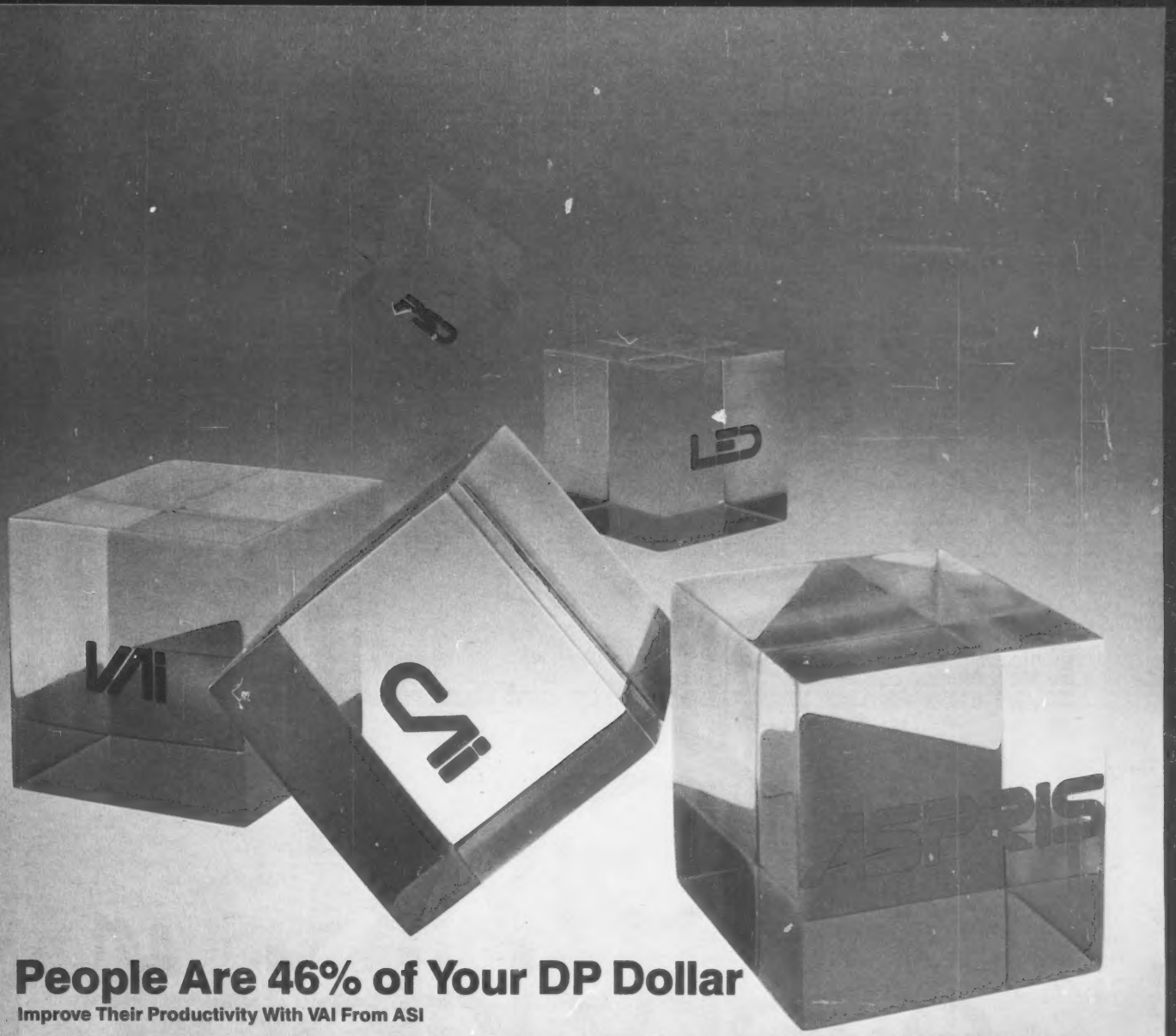
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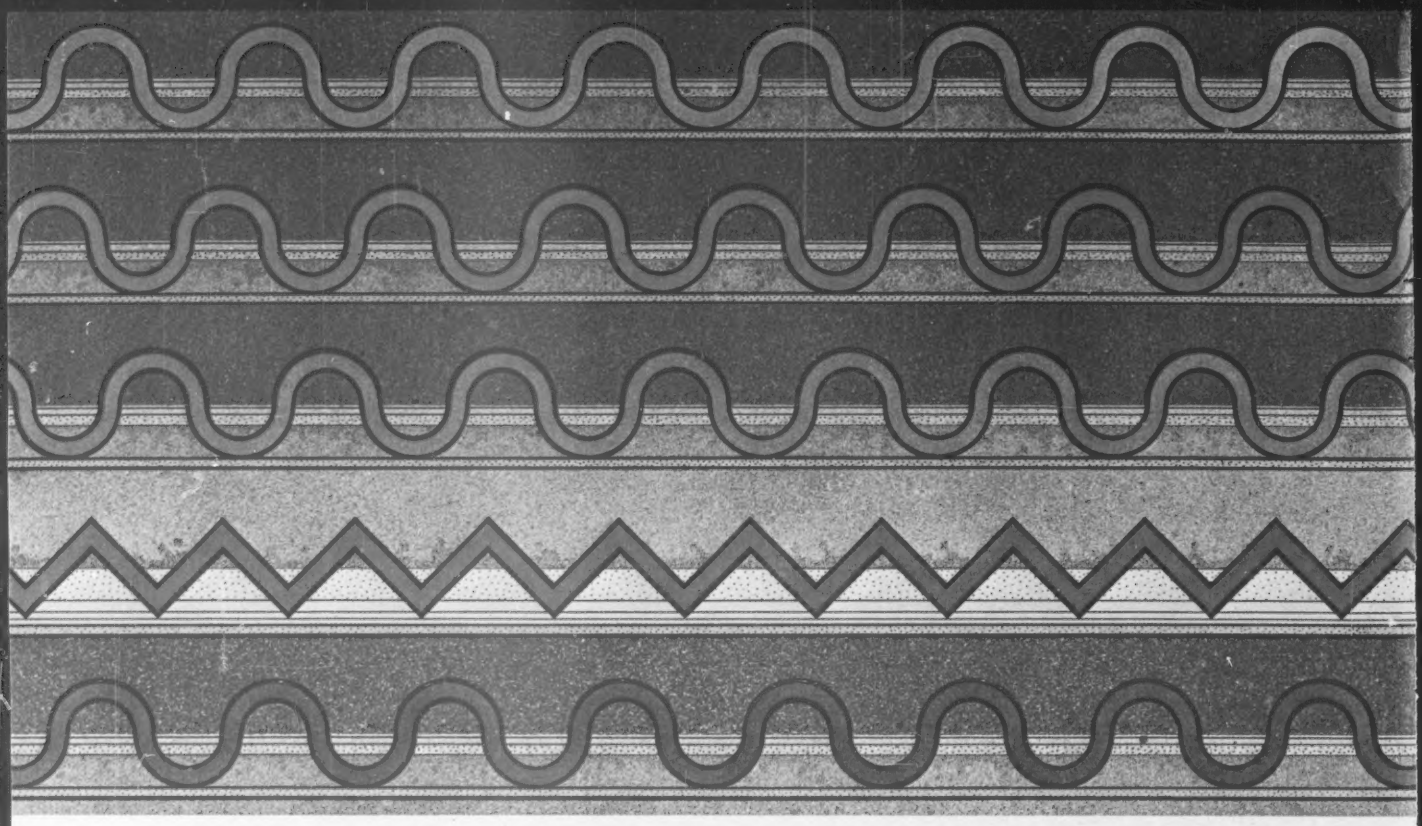


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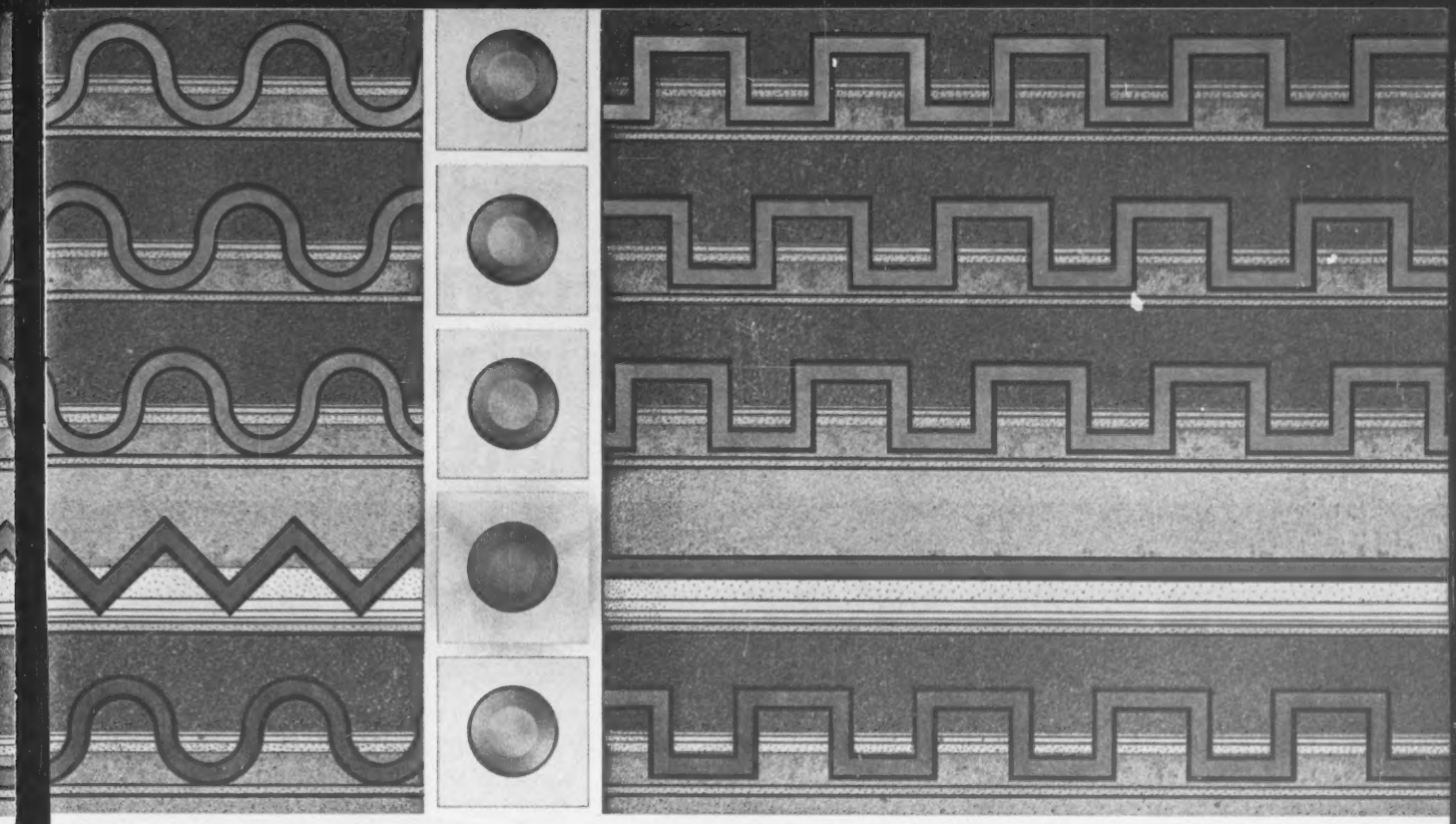
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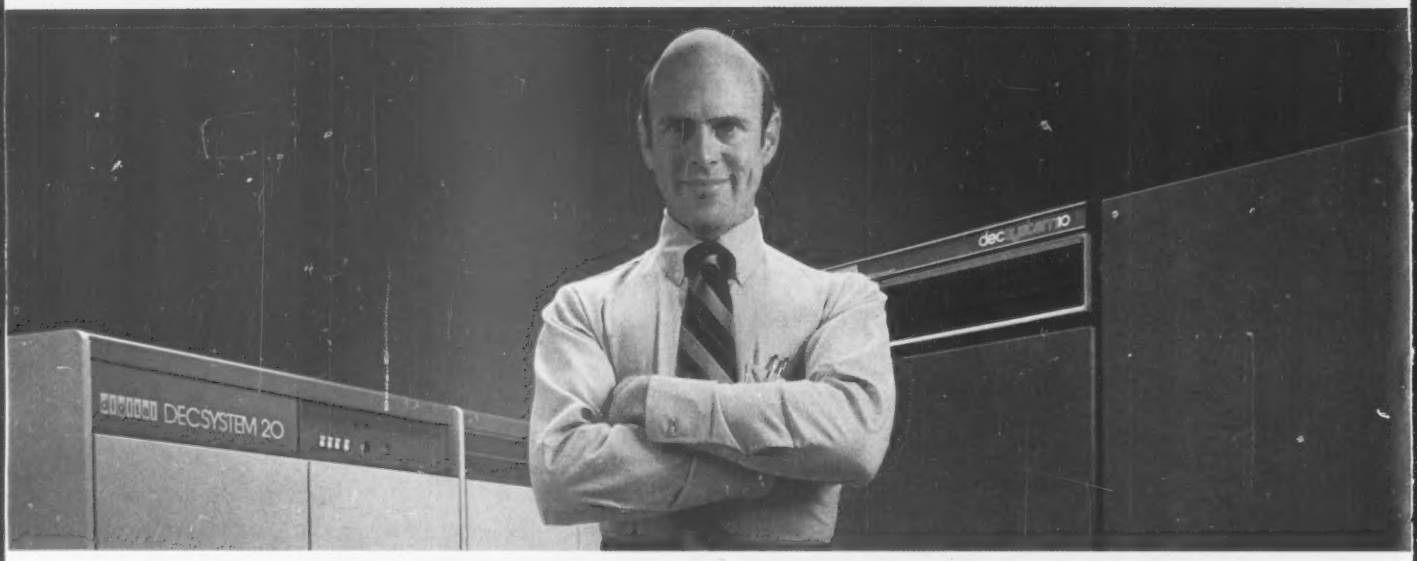
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IBM Takes Top Billing in Software Mart

SAN ANTONIO, Texas — IBM's $1.8 billion in revenue from software product and services was the largest of any participant in the $12 billion annual software industry, but represented only a 9.9% gain in revenues for the firm over those of the prior year, according to the third annual ICP 100 survey.

While it was no surprise that IBM took top billing in this industry segment, Digital Equipment Corp.'s 40% increase in software revenues — going from $422 million in 1979 to $589 million last year — marked the first time any hardware vendor's revenue increase from software was greater than IBM's, the survey performed by International Computer Programs, Inc. revealed. The results of the survey were released at ICP's executive conference here recently.

Within the hardware vendor fold, Control Data Corp. last year became only the second vendor to have annual software revenues top $1 billion. The average growth of software revenues for the top five hardware vendors was 12.6%, while the top five independent software vendors grew on the average by 33.3%, the survey found.

Although 75% of software revenues were generated by the top 25 companies in the industry, the 15% revenue growth within the top tier of companies was among the lowest in the industry. By comparison, those firms in the 26th through 50th positions saw revenues increase an average 30%.

A testimony to the fast rate of growth in the industry was that it took a minimum of $14 million in sales to gain a slot on the ICP 100 last year, compared with $9 million in revenues in 1979 — a 56% increase in the minimum revenue requirement.

Of the firms with revenues derived primarily from packaged software sales, Management Science America, Inc. (MSA), Cincom Systems, Inc. and Policy Management Systems (PMS) were the three top revenue producers, with sales of $48 million, $34 million and $32 million respectively. Revenue growth for the top 15 independent software companies was about 48% last year.

According to ICP, companies are becoming less specialized and willing to diversify. In 1979, 22 companies concentrated in a single software area, but last year only nine companies in the ICP 100 were that specialized.

PMS will market a turnkey system for the insurance industry this year, and Applied Data Research, Inc. introduced a turnkey system for the cable television market last year, the survey noted.

U.S. software companies are eagerly pursuing foreign markets, just as foreign counterparts are making inroads into the U.S. MSA doubled its international operations last year; Cincom Systems reported more than half of its revenues came from overseas; and Pansophic Systems, Inc. said 35% of its revenues was from outside the U.S.

NO.	COMPANY NAME	1980 RANK	1979 SP&S REVENUE (Millions)	1980 SP&S REVENUE (Millions)	REVENUE INCREASE (Millions)	% GROWTH 1979-1980
1	Policy Management Systems	44	$19.	$ 46.	$27.	142%
2	On-line Business Systems, Inc.	72	$ 9.	$ 20.	$11.	122%
3	Kirchman Corporation	53	$16.	$ 32.	$16.	100%
4	Prime Computer, Inc.	55	$15.	$ 30.	$15.	100%
5	McCormack & Dodge Corporation	87	$ 8.	$ 16.	$ 8.	100%
6	CACI, Inc.	63	$13.	$ 23.	$10.	77%
7	Computer Associates, Inc.	62	$15.	$ 25.	$10.	67%
8	Computer Data Systems, Inc.	91	$ 9.	$ 15.	$ 6.	67%
9	Computer Power, Inc.	86	$11.	$ 17.	$ 6.	55%
10	Data General Corporation	28	$68.	$105.	$37.	54%

Figure 1. The 15 largest software suppliers.

NO.	COMPANY NAME	1980 RANK	TOTAL CORPORATE REVENUE	% SOFTWARE REVENUE	1980 SOFTWARE REVENUE
1	Management Science America, Inc.	43	$52.	92%	$48.
2	Cincom Systems, Inc.	49	$37.	92%	$34.
3	Policy Management Systems	44	$46.	70%	$32.
4	Pansophic Systems, Incorporated	54	$31.	100%	$31.
5	Applied Data Research, Inc.	52	$37.	78%	$29.
6	American Management Systems, Inc.	40	$59.	49%	$29.
7	Software AG of North America, Inc.	58	$28.	93%	$26.
8	Computer Associates, Inc.	62	$25.	100%	$25.
9	Kirchman Corporation	53	$32.	59%	$19.
10	Cullinane Corporation	80	$18.	100%	$18.
11	Software International Corporation	84	$17.	100%	$17.
12	McCormack & Dodge Corporation	87	$16.	100%	$16.
13	Information Science Incorporated	88	$16.	100%	$16.
14	Insurance Systems of America, Inc.	67	$22.	64%	$14.
15	Rand Information Systems	76	$20.	70%	$14.

Charts Courtesy of ICP

Figure 2. Firms with largest revenue percentage growth: 1979-80.

IBM, AT&T, Xerox, DEC Seen Major Players in This Decade

By Marcia Blumenthal
CW Staff

SAN ANTONIO, Texas — The major players emerging in the information processing industry during this decade will be IBM, AT&T, Xerox Corp. and Digital Equipment Corp., according to Oakley Mertz of the Gartner Group.

The industry has the potential to create an additional $50 billion in annual revenue by the end of the decade — about as much as the total industry produces yearly today — Mertz told executives attending International Computer Progams, Inc.'s conference here recently. That new revenue will come from office automation systems and home information systems.

Because of these opportunities, the industry is on the verge of unprecedented competition led by IBM, which has rediscovered elasticity and is intent on recouping market share lost during the 1970s.

At the same time, competition from Baby Bell, the anticipated information processing arm of AT&T, will emerge as well as

(Continued on Page 82)

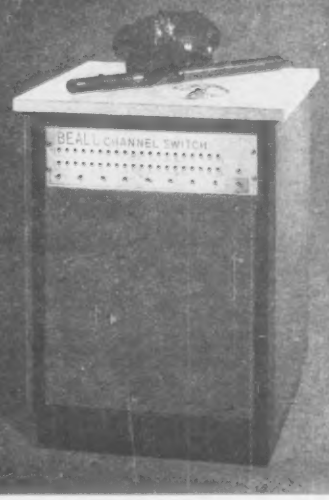
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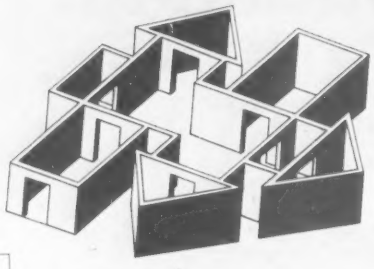
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• *Forms Automatix*

Exec Savors Challenge

By Bruce Hoard
CW Staff

BURLINGTON, Mass. — The ambience at Automatix, Inc. is more suggestive of basement tinkering than full-blown robotics systems manufacturing. In fact, the whole operation is downright informal, unpretentious and just plain relaxed.

But dynamic forces are at work inside the nondescript building next door to the Pewter Pot restaurant here. Phillipe Villers is at it again, riding the cutting edge of technology off into the future.

Eleven years after cofounding the hugely successful, computer-aided design-, computer-aided manufacturing-oriented Computervision Corp. in nearby Woburn, Mass., Villers, who fled Nazi-occupied France at the age of five, decided he wanted a new challenge. Computervision rejected his bid to create a robotics division, so he packed up his innovative imagination and headed down Route 128.

He decided to enter the business of modular turnkey robotics systems. Nobody else was doing it. Others were making robots, all right, but not robotics systems. And, to the gray-haired president, a robot is just another terminal.

His philosophy is simple: "When robots do the work, people don't have to work like robots."

The search for some well-heeled financial backers led to a prestigious coterie of contributors, including Harvard University, MIT, New England Merchants Bank and Memorial Drive Trust, which owns a majority interest in the consulting firm, Arthur D. Little, Inc.

The first $6 million in venture capital was soon followed by another $10 million and Automatix was off to the robotics races. Its first three products debuted at the October 1980 Robots V show in Detroit.

On one recent evening, Robotics International of the Society of Manufacturing Engineering (SME) gathered to hear Villers and tour the building. With about 75 of them (only the first shift) packed into a room lined with vending machines and coffee pots, the president launched into a slide presentation and narration he had obviously given many times.

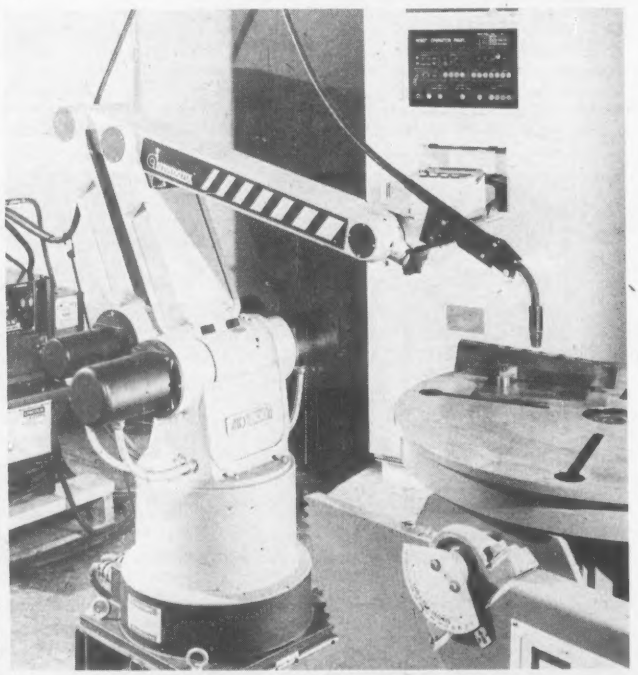
"To talk about robots is to talk about productivity," he told his audience. U.S. productivity is currently languishing at 1850 levels. Japan and Germany are moving ahead. Japan, with only half the industrial base, is employing twice as many robots. Worldwide sales are growing by 35% to 40% yearly and are expected to hit the $1 billion mark by 1985, he said, and those figures may be low.

Villers is a no-nonsense type of guy. A robot is not a "programmable, multifunction manipulator," but a "computer-controlled replacement for a human arm."

After the presentation, he fielded questions deftly. Each answer was concise, prepackaged and delivered in 30 seconds or less, sometimes with an anecdotal tagline. Bang, bang, bang. One group was out and the next one shuttled in.

The assembly area downstairs looks like a Ma and Pa shop in somebody's basement. Partially assembled Autovision II controllers await completion among a tangled array of lunchroom-style tables piled high with colored cable. Cardboard signs hanging from the ceiling designate various workstations — "Cable Assy," "PCB Tests," "Final Tests" and so on.

Autovision II is one of three systems offered by the company. Powered by a 32-bit Motorola Model 68000 computer, it features 128K bytes of memory, an integrated CRT



The Robovision I Arc Welding System

Prestigious Backers • of Turnkey Robotics

terminal, up to four General Electric TN 2200 or TN 2500 cameras for vision, an AID 800 robot arm and an $85,000 price tag. The basic gray controller box stands about five feet tall and resembles a guitar amplifier.

The system was designed for automatic visual inspection, sorting and vision-based robot guidance. In an adjacent area, it was being demonstrated for a gaggle of curious onlookers. The object of its attention in this case was a thin steel plate, about six inches by six inches, lying on a light table. The bright background helps the binary-based vision system discern an outline of the plate.

Kathy L. Kessel, applications engineer, answered questions about the machine for the onlookers. Asked if it is fun to work at Automatix, she evinced what appeared to be a unanimous sentiment: "It's a blast, it's great."

Down the way a bit, Dick Parent, manager of Customer Support, was putting the Robovision I system through its paces. Robovision I will soon be replaced by Robovision II, which has been announced, but not yet shipped. The system was designed for arc welding, a job Villers claims will become the No. 1 robot application in the near future.

Parent explained how the arm was programmed to weld. Automatix developed its own robot user language, Rail (Robot Automatix, Inc. Language), which was designed to allow nonprogrammers to direct intelligent robots. By pushing a series of "teach" and "store" buttons on a portable control panel about the size of a large transistor radio, he gave step-by-step instructions to the arm, which obediently obliged his every request.

"Voila," he said. "It works every time."

But the truth was the testing, and after Parent closed a transparent orange curtain, the long, green arm and its copper nozzle bent purposefully to the task. The end result was an explosion of hot sparks from the metal part under fire.

Is all this fun for Parent? "Absolutely a ball," he replied. "I'm having the best time of my life."

Production statistics are proprietary and something of a mystery to the company itself, according to Product Line Manager Gordon J. VanderBrug, former head of research of robotic vision at the National Bureau of Standards. VanderBrug is one of many top robotics experts (many of whom took pay cuts) who were lured to the promise of a better tomorrow by the seductive Villers.

The software for the systems is strictly homegrown, said Carole Cotton, national sales manager. With approximately 40 of 65 employees working on software development, she said, there is no other group that can match its expertise. And the movement is definitely forward.

"We're not correcting last year's mistakes," she commented. "We'll worry about them later."



Autovision II Vision System

Amdahl Earnings Up Sevenfold In First Quarter 1981

SUNNYVALE, Calif. — Amdahl Corp.'s earnings improved dramatically during the first quarter of its current fiscal year, rising to $5.7 million, or 28 cents per share, from $800,000, or four cents per share, in the comparable quarter of 1980.

Amdahl President John C. Lewis said, "The company's first-quarter results reflect a resumption of strong demand for our 470 products after some customer hesitation in the market to evaluate new product announcements made in the fourth quarter of 1980."

Revenues for the company grew at a slow 8% rate, reaching $95.5 million, up from $88.5 million in the like quarter a year ago, the company president said.

Lewis also said that a continuation of the 1980 purchase trend together with a higher profit margin were responsible for the company's cash level reaching an all-time high of $97 million.

The company's goal was to earn $50 million yearly within five years, but that figure has now been revised.

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With Nonstop II First Step

Tandem Expects $1 Billion Operation by 1985

By Robert Batt
CW West Coast Bureau

PALO ALTO, Calif. — The introduction by Tandem Computers, Inc. of its new Nonstop II system for on-line transaction processing [CW, April 20] is the first in what the company hopes will be a series of major systems announcements over the next few years.

With revenues of more than $108 million in 1980, first-quarter revenues this year of $40.6 million and a growth rate of 95% every year, broad market acceptance of Tandem's Nonstop concept is seen probable. The company itself expects to be a $1 billion operation within the next five years.

Tandem estimates that the market for on-line transaction processing will grow at between 20% and 30% a year to reach an installed base worth $7 billion by 1985. Company executives hope that the Nonstop II, with its extended architecture and addressability features will enable Tandem to increase its share of this growing market.

Long-Term Plans

James G. Treybig, president of Tandem, explained the importance of the new announcement to the company's long-term plans: "The Nonstop II system is our next logical step in refinement of on-line transaction processing solutions.

"It has been engineered for the future and will be the cornerstone for significant system development by Tandem over the next several years. The acceptance of the Nonstop concept and capabilities has resulted in a dramatic increase in the size of on-line applications our users now want to implement on Tandem systems," he said.

According to Tandem, the Nonstop II has the ability to cater to a vast number of interactive terminals, communications lines and large geographically distributed data bases in a way that the old Nonstop I system did not.

The company wants to be ready for what it anticipates will be a boom in integrated office technology. As such, a lot of emphasis has been placed on Expand, Tandem's networking software package.

"Future technology is going to change the architecture of future systems. With very large-scale integration [VSLI], in a few years you will be able to put 10,000 gates on a single chip. That's as big as our current processor and so we are looking at the future shape of computer architecture systems," according to Bob Marshall, Tandem's chief operating officer.

Treybig claimed that gate-array technology would have the most significant impact on Tandem's ability to build better systems.

Current R&D

After years of legal wrangling, the company was successful in obtaining a patent for its complete Nonstop systems architecture and much of its current research and development is aimed at maintaining that lead as new companies strive to enter the market.

On the hardware side, the emphasis has been on reducing service costs and improving communications as the cost of maintenance continues to outstrip inflation. Fault-finding and internal diagnostics techniques have received a significant portion of the firm's R & D funds.

Within the next few months, two new system-integration and test-operating plants will be opened at Santa Clara, Calif., and Reston, Va. The company stresses reliability, and each fully configured system receives 72 hours of testing before shipment, the firm said.

"Because we are operating in a high data communications environment, we want to provide our users with a sound basic network so that they can concentrate on their own internal applications," said Mike Green, vice-president and cofounder of Tandem.

In the software arena, Tandem believes it holds a significant lead that will protect it from any major buffeting at the hands of its competitors. Marshall said, "Since 1976 we have written a whole new level of software — our third — and we need to maintain our lead. Corporations are going to push more of the control and information out to users, and the thrust is going to be in programmer productivity tools which will allow a user to bring up an application more quickly by improving the power of the software with which they write the program."

Self-Financing

An operating profit of 19% means the company is relatively cash rich and self-financing with all expenditures financed through equity. In the quarter just ended, the company spent $3.4 million on R&D, and Tandem believes the high cost of development will prevent a rush of competitors into the market.

Productivity per employee is $108,000 a year, making Tandem —

(Continued on Page 82)



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Tandem Looks to Five-Year, $1 Billion Operation

(Continued from Page 78)

with 1,630 employees — the most productive company in the computer industry.

Its list of customers is impressive, spanning 27 different industries, including seven of the top 10 U.S. banks and containing several large contracts with government agencies such as the Federal Aviation Administration and the Navy. Banks, in fact, are currently Tandem's largest customer group, accounting for approximately 10% of its business, according to the firm.

To date, the company has shipped 1,538 processors with an average value of a quarter million dollars. There are 330 Tandem users in total, with 50% of company business in any one quarter coming from existing customers, who on average have four Nonstop processors, according to the firm's spokesman.

The prosperity which Tandem is now enjoying is demonstrated by the fact that in the last quarter the company received 40 new orders from customers including Hughes Aircraft Corporation, the British Post Office and the McDonalds restaurant chain, a spokesman for the firm said.

With 30% of total revenues earned overseas, exports play a major role, the UK, Germany and Canada being the principal markets.

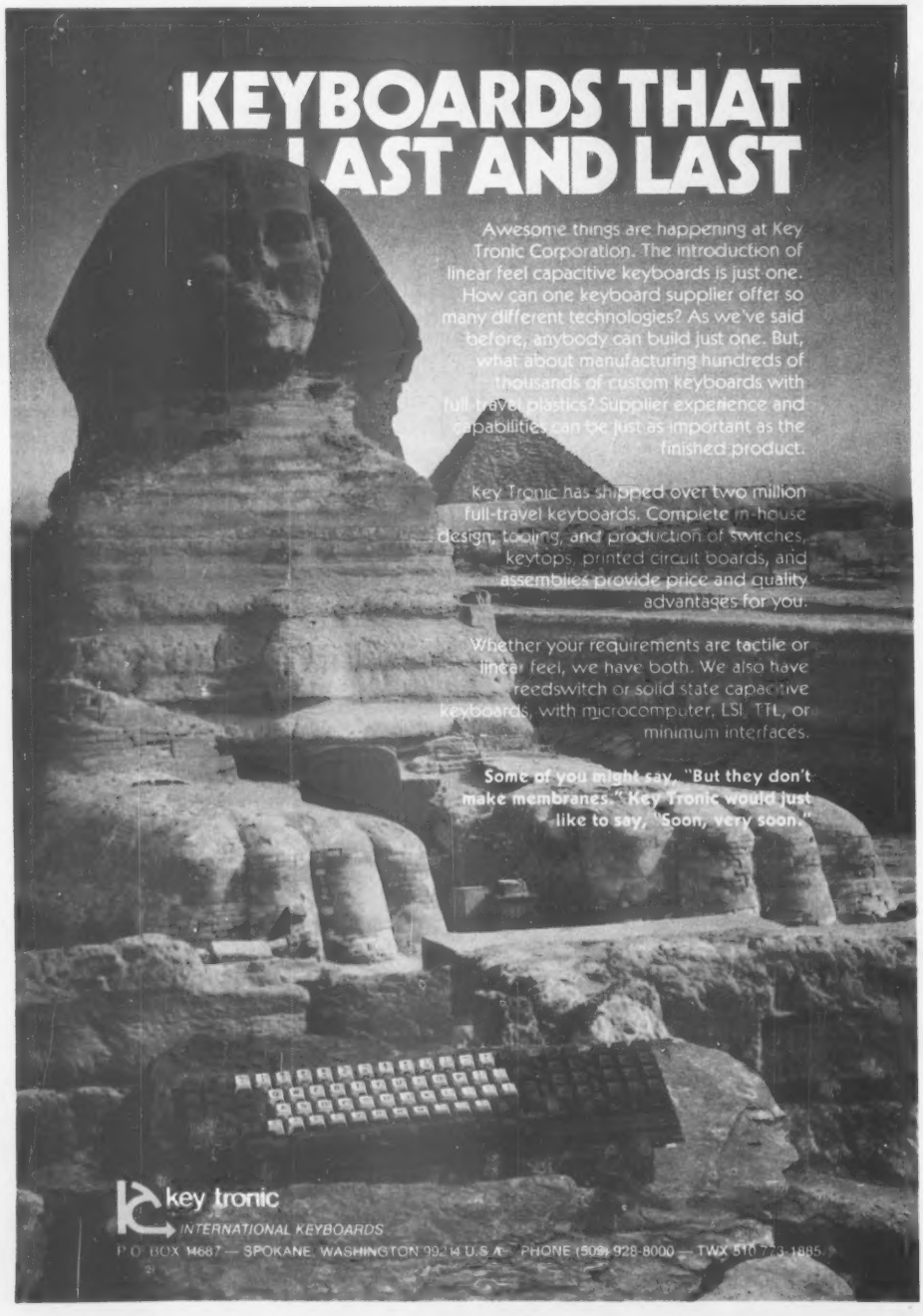
Company Strategy

There seems little doubt that Tandem has developed and is executing a clearly defined set of strategies designed to establish the company as a leader in on-line transaction processing for big industrial companies and financial institutions.

The availability of continuous computer resources, as provided by the Nonstop system, is reportedly becoming increasingly attractive to sophisticated end users that recognize the disruptive and costly effects of systems breakdowns on their operations.

For Tandem, the major problem will be to manage its growth and maintain its high productivity-per-employee ratio.

As Treybig put it: "Growth rate determines management structure and how you do things. The key is to have enough outstanding people working cohesively together. What limits you is how fast you can develop your people, and that is what we intend to concentrate on."



Growth Decade Predicted In '80s

(Continued from Page 75)

from foreign competitors with strong government backing and from the likes of DEC, Exxon Enterprises, Inc., Sears Roebuck & Co. and others.

Each of the major competitors will approach the market from a different perspective. IBM is aiming to be the low-cost producer of information processing goods and the force in transforming the computer industry to the information industry, Mertz maintained.

Change in Tactics

IBM's past tactics of setting a "price umbrella" and its stress on aggressive marketing has actually lost share for the company by creating demand the firm could not fulfill, which ultimately drove business into the arms of competitors, Mertz explained.

During the decade, IBM will strive to meet that demand by increasing unit volume production while lowering prices. Gearing up for production, IBM has increased production space fourfold from 1978 to 1980.

From 1972 to 1980, IBM's revenue per square foot of production space grew 11% per year. However, this increase is expected to show a 15% growth this year and 18% during 1982 and 1983, the IBM watcher predicted.

"IBM is investing in its future and at a rate comparable to an aggressive plan," Mertz said.

IBM will secure major growth from small systems and office systems and will be less stringent on profit margins as it pushes more products to market, he predicted.

Japanese Competition

However, IBM is not unaware of the strength of other major competitors, particularly Japan, Inc. Japanese firms will be selling a full array of systems, including office systems, under their own labels, with their own software and maintenance, Mertz predicted.

Moreover, all competitors will continue to devise increasingly clever means of cutting down people costs. This is already being observed as retail centers proliferate and remote diagnostic maintenance catches on.

Like IBM, Xerox is seeking to become a leader in office automation systems by producing all parts of the system and heavily emphasizing marketing.

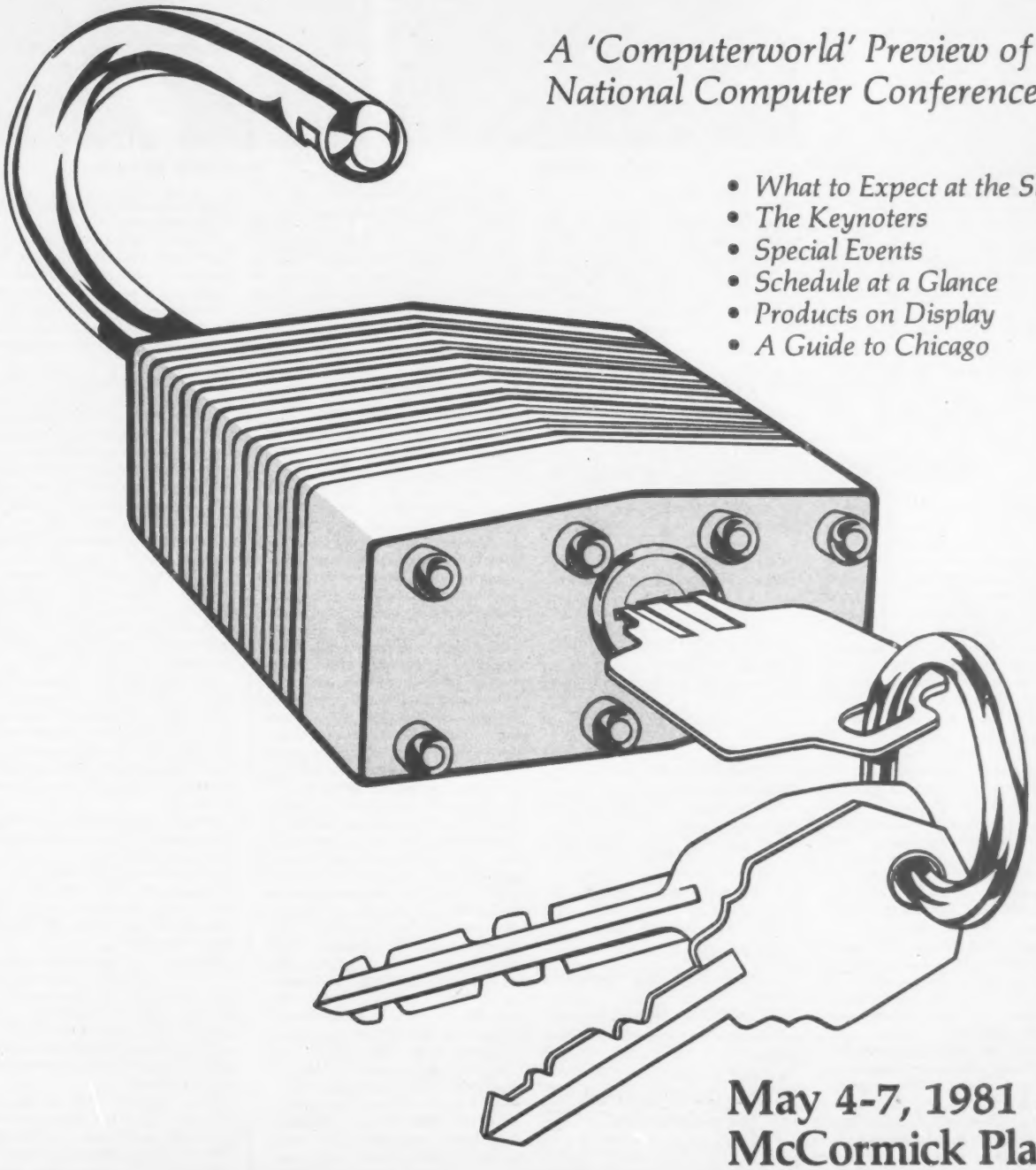
AT&T is reportedly lying in wait as the industry becomes increasingly communications-oriented.

While DEC's future strategy is somewhat elusive at the moment, Mertz noted, DEC is growing faster than IBM did and could be as large as IBM by the 1990s. "Only after insatiable demand for DEC's small systems tapers will the company's long-term strategies emerge."

NCC '81
Keys to Productivity

A 'Computerworld' Preview of the National Computer Conference

- *What to Expect at the Show*
- *The Keynoters*
- *Special Events*
- *Schedule at a Glance*
- *Products on Display*
- *A Guide to Chicago*



May 4-7, 1981
McCormick Place
Chicago

Bellisario, Blumenthal To Give Keynotes



Marisa Bellisario



W. Michael Blumenthal

CHICAGO — For the first time in National Computer Conference history, one of the keynote speakers is a woman. Marisa Bellisario, general manager of Italtel, will be sharing keynote functions with W. Michael Blumenthal, chairman of the board and chief executive officer of Burroughs Corp.

Bellisario will be speaking at a plenary session on Monday, May 4, at 10 a.m. In a speech entitled "The New Field of Telematics," she will address the growing significance of telecommunications/data processing, with special regard for the European approach and the positive impact on productivity in the office.

After an introduction by Illinois Gov. James R. Thompson, who has proclaimed the week of NCC as National Computer Week in Illinois, Blumenthal will speak at the plenary session on Wednesday, May 6, at noon.

Blumenthal was elected to the board of directors of Burroughs in 1979. He became vice-chairman of the board in February 1980, and chief executive officer of the company in September 1980. He assumed the position of chairman of the board in January 1981.

Born in Germany in 1926, he received a bachelor of science degree in business administration from University of California at Berkeley in 1951 and a master of public affairs degree, as well as master's and doctoral degrees in economics from Princeton University in 1953 and 1956 respectively.

After teaching economics at Princeton from 1954 to 1957, he joined Crown Cork International Corp. where he rose to vice-president and director. In 1961, he joined the U.S. State Department as deputy assistant secretary of state for economic affairs.

He became ambassador in 1963 and served for four years as the president's deputy special representative for trade negotiations under presidents Kennedy and Johnson.

Blumenthal joined Bendix Corp. as president of Bendix International in 1967. He assumed the top executive position of chairman of the board, chief executive officer and president in 1972.

Following a 10-year career with Bendix, Blumenthal returned to Washington in January 1977 as the 64th U.S. Secretary of the Treasury. He served in that position until his resignation in August 1979.

Bellisario is considered the highest ranking woman line executive in the computer industry worldwide. A graduate in economics from the University of Turin, she joined Olivetti Corp. as a programmer and rose to president of Olivetti Corp. of America by 1979.

She was charged with turning the U.S. subsidiary into a profitable company within three years. By 1980, Bellisario had improved productivity dramatically. Sales rose only 3%, but the company's deficit was cut from $37 billion in 1978 to $9 million at the end of 1979.

Bellisario was recalled to Olivetti's Ivrea, Italy, headquarters to become a member of the parent company's executive committee and to explore joint research and development projects for Olivetti and its new partner, CII Honeywell Bull, the French computer company.

After General Electric Co. purchased the Underwood computer division from Olivetti in 1969, Bellisario worked with this company and later joined Honeywell, Inc. when it bought GE's business. She returned to Olivetti in 1972.

Early in 1981, Bellisario left Olivetti to join Italtel as chief executive.

Afips: What, Why and How

ARLINGTON, Va. — By now, just about everyone has figured out that a thing called the American Federation of Information Processing Societies (Afips) is sponsoring the National Computer Conference. Some may have also figured out it's the federation's 20th anniversary.

But Afips, headquartered here, does more than sit around all year waiting for this particular conference to roll around. It provides a variety of other services as well.

For starters, Afips isn't one organization. It's a federation of 13 associations dedicated to various aspects of data processing. Afips is responsible for coordinating the information exchange among those organizations and disseminating it to the public.

Afips also acts as a liaison between the member societies and the government. And it maintains two libraries of computing-related material, one at its main office in Arlington, Va., and another at its Washington, D.C., office.

Afips is the U.S. representative to the International Federation for Information Processing (Ifip). It publishes proceedings from its conferences, as well as information from member societies.

In addition, Afips is a partner in the Charles Babbage Institute, a historical society devoted to keeping track of the information processing chronology. Afips contributes $50,000 a year to the Babbage Institute, and four Afips members sit on the Babbage Institute's Board of Trustees.

Afips also has its own historical committee, the Afips History of Computing Committee, which focuses on the history of computers as well as the people who designed them. That committee tries to preserve things like working papers, obsolete manuals, hardware componentry and so forth.

These are the groups that make up the American Federation of Information Processing Societies:

- *American Society for Information Science.*
- *American Statistical Association.*
- *Association for Computer Linguistics.*
- *Association for Computing Machinery.*
- *Association for Educational Data Systems.*
- *Data Processing Management Association.*
- *Instrumentation Society of America.*
- *Society for Industrial and Applied Mathematics.*
- *Society for Computer Simulation.*
- *The IEEE Computer Society.*
- *Society for Information Display.*
- *Charles Babbage Institute.*
- *International Federation for Information Processing.*

Afips also sponsors the Office Automation Conference (OAC), a smaller version of the National Computer Conference aimed at the office-of-the-future audience.

However, Afips is best known for NCC, which is clearly "the" event in the computing industry. But all the hoopla over NCC can also be a worrisome thing, Afips President Paul Rasig says. NCC was envisioned more as an educational experience as opposed to a giant flea market of computer equipment. And keeping sight of the original objectives of the show is quite difficult, he said.

"We must keep very alert," Raisig said, adding that Afips must maintain its educational objectives while altering its offerings to meet the changing needs of the industry. More people are getting into the personal computing market. And they will be looking for more information. That's just one area that Afips will have to address in the future, Raisig noted.

NCC is Afips' largest moneymaker. But most of the profits go to paying NCC bills — labor, rent, publicity and so forth. What is left over, usually in the neighborhood of $200,000 to $300,000, goes back to the Afips members. IEEE, ACM and DPMA each receive 15% of the profits, while the Society for Computer Simulation gets 5%.

Afips itself receives 50% of the profits. The rest of Afips revenues come from the Afips Press, which publishes conference proceedings as well as other publications, press member dues and other sources of income, the federation said. Those revenues go to fund the publications, history of computing project and conferences.

Thirty Years After First Show

NCC '81 Ready to Open in Windy City

The National Computer Conference opens next Monday and Computerworld *will be there — every day. The* Computerworld/Computer Business News Daily *will offer 64 jam-packed pages of show information and things to do in Chicago. It will be distributed free at conference hotels and the CW booth on the exhibition floor.*

CHICAGO — In 1951 Harry Truman was president; U.S. involvement in the Korean War was escalating; Julius LaRosa's singing filled the air waves; and the first commercial computer was delivered to the census bureau.

And an organization to be called Afips produced its first Joint Computer Conference (JCC).

As the industry has grown, so has its premiere event. Thirty years later, the joint conferences have evolved into the National Computer Conference, and the 1981 show will feature 100 program sessions, 21 Professional Development Seminars, 230,000 net square feet of exhibit area, the Personal Computing Festival and a Pioneer Day Program.

From its beginnings in Philadelphia, the JCCs were held in the spring and fall, alternating at locations convenient to both coasts. In 1973, Afips consolidated the two conferences into a single show, drawing 32,500 people that year. Seven years later in Anaheim, Calif., more than 80,000 showed up to hear industry leaders and to learn about the latest developments.

While 302 companies exhibited at 937 booths in New York in 1976, NCC '81 projected figures show more than 525 exhibiting companies with 2,300 booths included in the McCormick Place exhibition areas.

"No matter how impressive the statistics, the important thing to remember is that the quality of the program has improved as well. We're not just getting bigger, we're also getting better," declared Albert K. Hawkes of Sargent & Lundy Engineers, Inc. here, NCC '81's chairman.

With an eye toward improvement of the conference itself, it is appropriate that "Keys to Productivity" should be the theme of this year's show. The four-day show's sessions will be divided into tracks and the registration fee entitles visitors to attend as many sessions as they desire.

The subject areas to be covered include hardware and architecture, network technology, capacity and performance analysis, software and information processing management.

Also covered will be education and societal issues, automating the office, computers at work, data base systems, natural language processing, artificial intelligence and visuals

The Personal Computing Festival will present sessions on professional and educational uses, business applications and language, and technical uses of personal computers.

At plenary sessions, industry leaders will discuss productivity and computers. Speakers will include keynoter Marisa Bellisario of Italtel in Milan, Italy, one of the top woman executives in the computer and communications industry, and W. Michael Blumenthal, chairman of Burroughs Corp. and former U.S. Secretary of the Treasury.

Also featured will be the popular Science Film Theater. Three theaters will run continuously, showing films on computer technology.

Making a repeat appearance from last year will be the film, *The Making of Star Wars*, the story behind the milestone movie and the role of computers in its production.

Wednesday, May 6, will be Pioneer Day, celebrating the 30th anniversary of Univac I, the first commercial computer. In two sessions, several of the pioneers who worked on this achievement will discuss just how it happened. As a bonus, a model of the Census Bureau's historic first computer will be on display in the conference registration area.

To make life easier for all attendees, conference management will again offer an International Visitors Center, free bus service, a message center and assistance for the handicapped.

The free bus service consists of shuttle buses that will run during conference hours from all conference hotels to McCormick Place. Schedules will be posted in the hotel lobbies.

The Message Center will take messages for attendees and post the names of those called. Management suggests those planning to attend NCC should leave the following number at home and at the office, and check regularly at the Message Center: 312-791-6690.

Attendees are invited to a special Early Bird Reception on Sunday, May 3, from 6 p.m. to 9 p.m. in the Jane Addams Room at McCormick Place. Then on Monday, May 4, there will be a conference reception from 6 p.m. to 8 p.m. in the Grand Ballroom of the Conrad Hilton Hotel.

And, of Course, the Fees . . .

CHICAGO — National Computer Conference registration and its accompanying fees come in a variety of configurations:

- For the full four-day conference program, exhibits and Personal Computing Festival, including conference proceedings and *Personal Computing Digest*, the cost at the door will be $75. For students, the same program without the proceedings costs $10.
- Exhibits only, Monday through Thursday, cost $20. One day only of program and exhibits is priced at $25, and one day only of exhibits costs $10.
- The three-day Personal Computing Festival, including all conference exhibits and *Personal Computing Digest*, costs $30, while one day only of the Personal Computing Festival — including program and all exhibits — costs $10.
- As for the Professional Development Seminars, Monday and Thursday, each half-day seminar costs $25, while Tuesday's and Wednesday's full-day offerings go for $65 each day.

Managers Offered Seminars to Brush Up On Skills, Behaviors and Techniques

CHICAGO — DP professionals who want to brush up on their skills in areas such as time management, personnel supervision and packaging an image for success can choose among 21 Professional Development Seminars to be offered at the National Computer Conference next week.

The sessions on Monday, May 4, will include "What Works With People," led by James F. Towsen of Towsen Associates. This will cover the role of a supervisor with employees, stressing communications, appraisal of employee performance and effective delegation of responsibility.

"Negotiating and Structuring the Computer Software Agreement," conducted by attorneys Peter Brown and Richard Raysman, will trace the software negotiation process from the identification of needs through proposal requests, proposal requirements, contract clause requirements and contract evaluation.

Other Monday sessions include "Quality Circles — A New Way to Manage" and "Learning About Microcomputers."

On Tuesday, May 5, "Managing Word Processing" will be offered. The speaker, Kit Thompson of Key Operational Techniques, will focus on the day-to-day functioning of a word processing system and ongoing systems management.

Also scheduled for Tuesday is "Computer Graphics for Management Applications" with Alan T. Paller of AVI Data Graphics as the speaker. In the session entitled "Security in Data Base Systems," Steven J. Ross of The Plagman Group, Inc. will discuss topics such as sharing of data, its privacy implications and the migration of security controls from the application into the environment.

Other sessions set for Tuesday are "Structured Concepts," "Computer Law," " The Brain: The Human Computer" and "Structured Programming."

'Disaster Recovery'

"Disaster Recovery," a session led by Robert P. Santis of EDP Security, Inc., will begin with suggestions for generating support for a disaster recovery program. It will include a study of specific needs and site preparation, as well as data security techniques, training, maintenance and testing.

Dr. Barbara A. Pletcher of Creative Sales Careers, Inc. will be the speaker for a session entitled "Packaging Your Image for Success" that will explore behaviors and techniques which can increase managerial effectiveness.

"Time Management," featuring Dr. Charles Kozoll of the University of Illinois' Department of Administration, Higher and Continuing Education, will include guidance on selecting a few relevant features of time management and building them into a program likely to succeed.

The DP control risks faced by organizations and alternative systems of control to defend against these risks will be the topic of discussion during the "Internal Controls of MIS and Data Bases" session with Dr. Allen G. Merten of the University of Michigan's Graduate School of Business Administration as speaker.

Areas of risk to be considered during this discussion include fraud, abuse or misuse, loss of data integrity, system failure and inefficient use of funds.

The sessions on Thursday May 7 begin with "Sexual Conditioning — How It Affects Business Relationships." The speaker is Lucille S. Schlosser. The session was designed to help men understand what women want and do not want and to help women understand some of the mistakes they can make, as well as why men sometimes behave in ways that are frustrating to women.

Marilyn Quackenbush of Kroehler Manufacturing Co. and James F. Ettwein of Keane Association, Inc. will lead a session entitled "Computer Software Support." Another Thursday session, "Internal Audit Function," will feature James Krema of the University of Chicago.

Each session will run for three hours, either from 9 a.m. to 12 noon or 1:30 p.m. to 4:30 p.m. The seminars are scheduled for a half-day on Monday afternoon and Thursday morning. The half-day sessions cost $25 each. On Tuesday and Wednesday, the price is $65 each day for two sessions, including lunch.

Further information may be obtained from the American Federation of Information Processing Societies, Inc., 1815 N. Lynn St., Arlington, Va. 22209.

National Computer Conference . . .

CONFERENCE AT A GLANCE

How to Use the Technical Schedule: Session Numbering Scheme

Each session of both the Technical Program and the Personal Computing Festival has been assigned a unique and meaningful number to aid in your personal scheduling. There are 14 time slots for sessions over three and a half days. Eight rooms are used for Technical Program Sessions, and three rooms are used for the Personal Computing Festival.

The session number consists of two parts. The digits to the left of the decimal point indicate the location:

1 Room 12
2 Jane Addams Room
3 David Mayer Theatre
4 John Evers Theatre
5 Theodore Lawless Room
6 Lindheimer Room
7 Lenox Lohr Theatre
8 Room 14
A Room 1
B Room 2
C Room 6

The digits to the right of the decimal point indicate the time period:

1	Monday Afternoon	1:30 p.m.-3:00 p.m.
2	Monday Afternoon	3:15 p.m.-4:45 p.m.
3	Tuesday Morning	8:30 a.m.-10:00 a.m.
4	Tuesday Morning	10:15 a.m.-11:45 a.m.
5	Tuesday Afternoon	1:30 p.m.-3:00 p.m.
6	Tuesday Afternoon	3:15 p.m.-4:45 p.m.
7	Wednesday Morning	8:30 a.m.-10:00 a.m.
8	Wednesday Morning	10:15 a.m.-11:45 a.m.
9	Wednesday Afternoon	1:30 p.m.-3:00 p.m.
10	Wednesday Afternoon	3:15 p.m.-5:15 p.m.
11	Thursday Morning	8:30 a.m.-10:00 a.m.
12	Thursday Morning	10:15 a.m.-12:15 p.m.
13	Thursday Afternoon	1:30 p.m.-3:00 p.m.
14	Thursday Afternoon	3:15 p.m.-4:45 p.m.

Thus, Session 2.1 would be in the Jane Addams Room at 1:30 p.m.-3:00 p.m. on Monday, while Session 5.8 would be in the Theodore Lawless Room on Wednesday Morning, 10:15 a.m.-11:45 a.m.

Please note: The times for some sessions of the Personal Computing Festival differ from this scheme. Please consult the full program or the Conference At A Glance for the exact time of these sessions.

NCC 1981
McCormick Place, Chicago, IL

Hardware and Architecture
Room 12

Network Technology and Capacity and Performance Analysis
Jane Addams Room

Software
David Mayer Theatre

Information Processing Management
John Evers Theatre

Education and Societal Issues
Theodore Lawless Room

Automating the Office and Computers at Work
Lindheimer Room

Database Systems and Computers at Work
Lenox Lohr Theatre

Visuals, Natural Language Processing, and Artificial Intelligence
Room 14

Personal Computing Festival

A. Professional and Educational Uses

B. Business Applications

C. Languages and Technical Uses

MONDAY

Monday Morning
May 4
10:00 a.m.-12:15

Monday Afternoon
May 4
1:30 p.m.-3:00 p.m.

1.1 Design Tools for System Architectures
George Kraft

2.1 Transport and Session Protocols in the Context of the ISO Reference Model
Leslie Jill Miller

3.1 Programming Languages for Small Systems
Leon Levy

4.1 System Implementation Strategy
Ken Zoline

5.1 Survey and Comparison of Model Curricula for Information Systems Education
Thomas Ho

6.1 Integrated Word- and Data-Processing Systems
Robert Elliott

7.1 Distributed Database Management Systems—Transaction Environment
James Swager

8.1 Image Analysis
K.S. Fu

Monday Afternoon
May 4
3:15 p.m.-4:45 p.m.

1.2 Innovative Architecture and Commercial Computers
Krishna M. Kavi

2.2 Packet Speech
Danny Cohen

3.2 Software Development Tools
R. Stockton Gaines

4.2 Audit and Control in a Database Environment
Steven Ross

5.2 Joint Business/University Professional Development and Research Programs
Robert A. Rouse

6.2 Office Automation Technology: Futures
James Carlisle

7.2 Database Machines
C. Robert Carlson

8.2 Pictorial Database Models and Query Languages
K.S. Fu

TUESDAY

Tuesday Morning
May 5
8:30 a.m.-10:00 a.m.

1.3 Microprocessor Architectures—What Next?
K. Vairavan and **Tadao Ichikawa**

2.3 Local Networks and the ETHERNET in Particular (I)
Gregory T. Hopkins

3.3 Functional Capabilities of Dictionary Systems
Belkis Leong-Hong

4.3 Technology Transfer: Management Issues
Conrad Weisert

5.3 Computers and The Future of Literacy
Frederick Goodman

6.3 Word Processing in Litigation and Information Retrieval
Haley Fromholz

7.3 Distributed Database Architecture
Hal Uhrbach

8.3 Intelligent Computer-Aided Instruction
Mark Fox

A.3

B.3

C.3 Keynote Session: New Direction in Personal Computing
Adam Osborne, Osborne/McGraw-Hill

Tuesday Morning
May 5
10:15 a.m.-11:45 a.m.

1.4 Perspectives on the History of Computing
Paul Armer

2.4 Local Networks and the ETHERNET in Particular (II)
Gregory T. Hopkins

3.4 Operating Systems
Joseph Leung

4.4 Planning for Technology Transfer
Robert Scheer

5.4 Issues Concerning National Computer Literacy in 1985
Dorothy Deringer

6.4 Computer Applications in Law Firm Management
Haley Fromholz

7.4 Database Practicum
Susan Rosenbaum

8.4 Computer-Based Educational Aids
Arthur Melmed

A.4 Medical and Dental Uses
Paul Hazan and **Ellia Neiburger**

B.4 Sales Management
Thomas Tighe

C.4 CBASIC2
Gordon Eubanks

Tuesday Afternoon
May 5
12:00-1:15 p.m.

Tuesday Afternoon
May 5
1:30 p.m.-3:00 p.m.

1.5 Fault-Tolerant Computing Systems
Gerald Masson

2.5 Management of Capacity Planning
Leonard Lipner

3.5 Software Reliability in Real-Time Systems
Bharat Bhargava and **David Clapp**

4.5 Implementing Technology Transfer
Denny O. Wallace

5.5 Effects of Computers on Personal Life
Abbe Mowshowitz

6.5 Simulation of Natural Systems
Roger Firestone

7.5 Research and Development in Distributed Database Systems
Cory Devor

8.5 Communicating with Computers in Natural Languages—Current Capabilities
Martha Evens

A.5 University Research and Administration
Thomas Madron and **Melvin Ray**

B.5 Financial Management Uses
Theodore Needleman, Carolyn Kaufman, and **David Chereb**

C.5 PL/1
Gary Kildall

Tuesday Afternoon
May 5
3:15 p.m.-4:45 p.m.

1.6 Contemporary Fault-Tolerant Computer Designs
William C. Carter

2.6 Network Capacity Planning
Jeffrey A. Bloom

3.6 Pascal: Standardization and Extensions
A. Winsor Brown

4.6 System Assurance: A Step Beyond EDP Audit
James Krause

5.6 Where is the Story? A Journalists' Panel on Trends in Computing
Brad Schultz

6.6 Future Office Systems
Tom Sinopoli

7.6 Database Systems Advances in Medical Systems
Meera Blattner

8.6 Communicating with Computers in Natural Languages—Future Promises
Norman K. Sondheimer

A.6 College Classroom Applications
Robert Judd and **Marilyn Jansen**

B.6 Production Management Use
Daniel Johnson

C.6 UCSD Pascal
Carl Helmers

. . . 1981 Schedule at a Glance

WEDNESDAY

Wednesday Morning May 6 10:15 a..m–11:45 a.m.

1.8 Microprogramming—The Challenge of the 1980's (II)
Samir S. Husson

2.8 Simulation of Computer Systems: Software and Hardware
Norman Schneidewind

3.8 Quantitative Measures for the Quality of Systems and Programs
Carma McClure

4.8 Business Communication: Security and Vulnerability
John Donovan

5.8 Planning Agenda for a National Health Information System
Marion Ball

6.8 Form Processing in the Office Environment
Mitch Zolliker

7.8 Simulation: A Tool for Business Decision-Making
Suresh K. Jain

8.8 Prospects for Artificial Intelligence Applications in Industry
N.S. Sridharan

10:15 a.m.–11:45 a.m.

A.8 Panel Discussion on Teacher Experiences
Dorothy Judd

B.8 Conferencing Management
David Stodolsky

C.8 XENIX Operating System
Steven Ballmer

Wednesday Morning May 6 8:30 a.m.–10:00 a.m.

1.7 Microprogramming—The Challenge of the 1980's (I)
Samir S. Husson

2.7 Capacity Planning in a Production Environment
James Cooper

3.7 Software Maintenance
Stephen S. Yau

4.7 Production Process in the Eighties
Russ Melton

5.7 Protection of Proprietary Interests in Software
Susan Nycum

6.7 Combining Office Automation and Data Processing—Its Technology and Usefulness
Dan Zatyko

7.7 Impact of Computing on the Handicapped in the Eighties
Samuel C. Lee

8.7 Artificial Intelligence in Electronics Design
Tom Mitchell

8:30 a.m.–10:00 a.m.

A.7 Educational Uses in Grades K-12
Charlaine Charlton, Dorothy Judd, and **Edwin Herstein**

B.7 Audio-Visual Communication
Howard Rothman, and **James Blum**

C.7 Star Database
Seymour Rubinstein

Wednesday Afternoon May 6 12.00–1:15 p.m.

Wednesday Afternoon May 6 1:30 p.m.–3:00 p.m.

1.9 Higher Level Microprogramming Languages and Optimization (I)
Bruce Shriver

2.9 Special Session: Pioneer Day—UNIVAC I
Carl Hammer

3.9 Maintenance of Programs and Systems
Ned Chapin

4.9 Data Entry Productivity
Lawrence Feidelman

5.9 Private Sector Policy Issues on the Use of Computer Technology in the Health Care Industry
Karen Duncan

6.9 Definition and Measurement of Application Software Productivity
Benn Konsynski

7.9 Computer-Assisted Analysis in Energy/Economic Models
Harvey Greenberg

8.9 Imaging and Computers
Diana Merry

1:30 p.m.–3:00 p.m.

A.9 Authoring Systems
Ronald Borta and **Donald Coyne**

Wednesday Afternoon May 6-3:15 p.m.–5:15 p.m.

1.10 Higher Level Microprogramming Languages and Optimization (II)
Bruce Shriver

2.10 Special Session: Pioneer Day—UNIVAC I
Carl Hammer

3.10 Software Development Facilities
Louis Brocato

4.10 Special Project Management
Clifton Merry

5.10 Alternative Data Processing Strategies for Hospital Information Systems
David Mishelevich

6.10 Electronic Mail: Current Developments
Walter Ulrich

7.10 Large Scale Database Applications
Eugene Kozik

8.10 Educational Uses of Personal Computers
Michael Tempel

3:15 p.m.–4:45 p.m.

A.10 Program Design and Selection
Michael Sloan, Daniel Isaacson, and **Timothy Smith**

Special Double Session

Robotics and Artificial Intelligence

B.9 Moderator: **Abby Gelles**; Panelists and Participants: **David Ahl, Ernest Kent, David Thornburg, W. Robert Hudgins, Norbert Tagge, David Jasper,** and **Steven Long**

C.9 PEARL—A Database Creation
William Stow

C.10 Standards and Implementations of Programs
Howard Hollander, Andrew Whinston, and **Gary Koehler**

THURSDAY

Thursday Morning May 7 8:30 a.m.–10:00 a.m.

1.11 Adaptable Architectures
Svetlana Kartashev and **Steven I. Kartashev**

2.11 Implementation of Experimental Local Networks
William Lidinsky

3.11 Quality Assurance—An Emerging Technology
Gene Altshuler

4.11 Motivation of Computer Personnel
J. Daniel Couger

5.11 Computer Professional as an Expert Witness
Alex Hoffman

6.11 The Electronic Office: A Futuristic Forecast
Richard Federico

7.11 Computing and Energy Technology Assessment
Ellen M. Leonard

8.11 Recent Computer Advances in Legislative Reapportionment
Lee Papayanopoulos

8:30 a.m.–10:00 a.m.

A.11 Software Sources for Teachers
Lloyd Prentice, M. Dundee Maples, Patrick Moyer

B.11 Programmer Problem Solving
William Lewis

C.11 Selector IV Multi-Key Database
Mark Robinson

Thursday Morning May 7 10:15 a.m.–12:15 a.m.

1.12 Architecture of Specialized Hardware Systems
William E. Farley

2.12 Local Networks: The Fundamental Technology of Office Automation
Harvey Freeman

3.12 The User Interface
Howard Lee Morgan

4.12 Recruitment, Retention, and Certification of Data Processing Professionals
Thomas A. Browdy

5.12 Library and Business Computer Use: What is the Difference?
Peter Lykos

6.12 Office Automation: The Federal Experience
Ira W. Cotton

7.12 Automated Testing for Increased Productivity
Leonard Gardner and **John Savage**

8.12 Applications of Artificial Intelligence to Law
L. Thorne McCarty

10:15 a.m.–11:45 a.m.

A.12 User Reactions to Software Sources
Robert Judd

B.12 PC Graphics
James George, Richard Phillips, Thomas DeFanti

C.12 Pascal MT+
Michael Lehman

Thursday Afternoon May 7 12:00 p.m.–1:15 p.m.

Thursday Afternoon May 7 1:30 p.m.–3:00 p.m.

1.13 Single Chip Microcomputers—Where Are They Headed?
K.S. Padda

2.13 Use of Models in Capacity Planning
Satish K. Tripathi

3.13 The Public Release of Smalltalk-80
Daniel H. Ingalls, Jr.

4.13 User Requirements Analysis
Raymond Yeh

5.13 Developing Software Engineers in Industry
Pei Hsia

6.13 Choosing a Computer Language for a First Problem-Solving Course
Robert J. McGlinn

7.13 Computing Applications in Magnetic Fusion Energy Research
John T. Hogan

8.13 Expert Systems and Knowledge Engineering
N.S. Sridharan

1:30 p.m.–3:00 p.m.

A.13 Noncurricular Uses
John Longstreet, Charles Kaufman, and **J.R. Kilpatrick**

B.13 Data Acquisition and Display
Richard Fergus and **David Carroll**

C.13 Future of Bar Code Technology
Walter Banks

Thursday Afternoon May 7 3:15 p.m.–4:45 p.m.

1.14 The Application of Peripheral Array Processors
Walter J. Karplus

2.14

3.14 Computer-Based Tools for Software and Systems Engineering
Gerald Estrin and **Ray Houghton**

4.14 A Survey of Project Management Software Packages
Linda Taylor

5.14 Developing Software Engineers in the Universities
Frederick E. Petry

6.14

7.14 Computational Methods in Inertial Confinement Nuclear Fusion
Keith A. Taggart

8.14

3:15 p.m.–4:45 p.m.

A.14 Federally Funded Applications
William Jean Alexander and **Alfred Fisher**

B.14 Special Session Panel on Disk Operating Systems
Sol Libes

C.14 Application Software's Learning It's Language
Aristotle Lekacos

'Conference Within a Conference'

Festival to Explore Joys of Personal Computing

By Bill Laberis
CW Staff

CHICAGO — As a conference within a conference, the Personal Computing Festival (PCF) running here next week with the 1981 National Computer Conference will feature a diversity of program sessions, panels and applications geared to the small business owner as well as other professionals and hobbyists.

Predicated on the belief that not everyone attending NCC is interested in looking at the biggest and most sophisticated computing equipment, PCF and its exhibits will, for the first time, join the rest of the conference in the main exhibit area at McCormick Place here.

The conference is intended to give convention-goers the chance to explore the complete spectrum of information processing, while concentrating on those aspects of personal computing of greatest interest to the small user.

The use of robotics and artificial intelligence will be highlighted along with new equipment displays, applications exhibits and other recent developments in the personal computing field, PCF organizers said.

In more than 30 technical sessions, PCF will follow along the lines of this year's NCC theme, "Keys to Productivity." The sessions will provide a forum for participants to discuss ideas and approaches to shared problems and to find out what new developments to expect in the year ahead.

Keynote speaker Adam Osborne of Osborne/McGraw-Hill will kick off PCF on Tuesday, May 5, with his address "A New Direction in Personal Computing."

The 30 program sessions to follow will be divided into three tracks: professional and educational uses, business applications and languages and technical uses.

Robotics Discussion

A special double-panel session on Wednesday will feature Abby Gelles of Carnegie-Mellon University who will moderate a discussion on "Robotics and Artificial Intelligence."

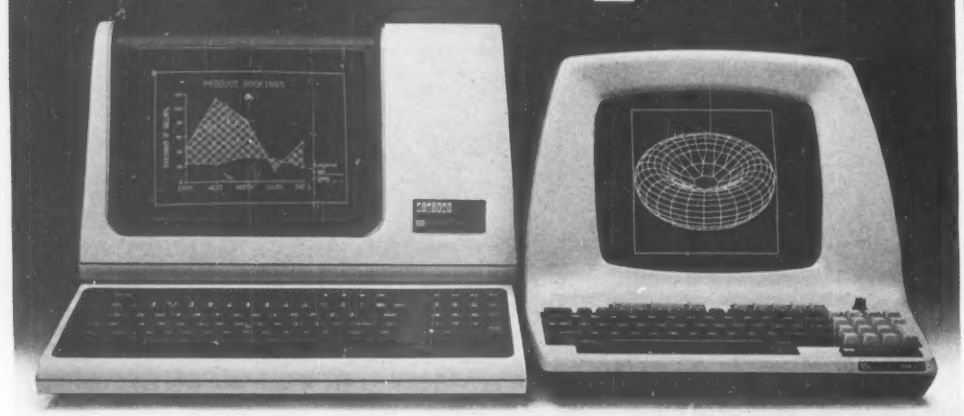
Although the many personal computing exhibits will be intermeshed with the other NCC exhibits, PCF organizers will host their own series of 22 noncommercial demonstrations in the personal computing area. The organizers will also set up a hands-on applications room featuring various games and a video theater with tracks outlining the history of microcomputers.

Educators will find programs devoted to uses of small computers in grades kindergarten through 12 as well as college classroom applications, software resources for teachers and university research and college administration applications, PCF organizers reported.

Business applications include presentations on sales management, production management uses, uses of financial management, graphics and conferencing management. Participants can learn more about the Basic and Pascal languages and get first-hand information about the Xenix operating system, bar-code technology and other language-related topics.

Registration for the PCF program and all conference exhibits, including a copy of the *Personal Computing Digest*, is $30.

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Where Next? Terminals Set To Offer Help

CHICAGO — For the foot-weary attendee at the National Computer Conference lost amid the 535 company-sponsored displays within 230,000 square feet of exhibit space, relief will be spelled T-E-R-M-I-N-A-L.

Interaction Systems, Inc. of Newtonville, Mass., is installing eight Model TT-100 touch-sensitive CRT terminals throughout McCormick Place that will be programmed with directories of information about the program and exhibitors.

The more than 60,000 DP professionals expected to attend NCC can approach the terminals, which will be mounted on pedestals, and touch an area on the screen corresponding to exhibitors or conference events. The terminals will display exhibitor names, booth location, new products and services descriptions and the "NCC Conference Guide."

"More and more public access to information is being demanded," Walter A. Winshall, president of Interaction Systems, said. "It is going to be a large show, and people will need online information to ensure a productive visit to the exhibit area and the conference."

Leave Your Checkbook Home

NCC Buyer: Beware Prototypes and Promises

By Hillel Segal

CHICAGO — The National Computer Conference offers a chance to see all the latest wrinkles in computer design, inviting all customers to investigate — and invest. For sale on the exhibition floor will be all the very latest in micro, mini and big computers: the systems of today (or is it tomorrow?) for the offices of the future (or is that already the past?). Beside them are all the peripherals, software and doodads that make computing happen.

If you bring your checkbook with you — and hopefully you wouldn't really do that — it would be easy to go wild, ordering the newest systems after a demo in the booth and a few drinks at the hospitality suite. That would hardly be wise, however.

Wild Scramble

The world of computers today is a wild scramble to design, manufacture and deliver the automation systems which today's businesses demand. Both technology and software are in a state of flux more rapid than any ever known before. Systems undreamed of last year are being announced today and will be delivered as soon as the paint is dry on the cabinet. In some cases, that will be long before the ink is dry on the final design plans.

In the midst of such rapid change, customers are hard put to stay current with the best available equipment and yet avoid the unpleasant experience of debugging someone's oversold and undertested dreamboat. Don't let it happen to you.

Let's face it. Much of what is on display at this convention consists of engineering prototypes which have no place in a customer's office. They haven't been fully designed or fully programmed. The functions which are demonstrated to prospective buyers are often a minimal subset of the intended features. In some cases, the buyers aren't even allowed to try their hand at operating the machine — for fear they will attempt to use an unimplemented function and blow up the prototype software.

Many of these systems, down the road six months or a year, will be very fine computers with good performance, good reliability and all the latest advancements American (or foreign) ingenuity can provide. But without a track record of success in the user environment, who can tell the beauty from the beast?

The most difficult systems to evaluate are those which are not yet in production. You'll know the ones: "delivery date — 1982." They may sound great on paper, but remember, you can't eat promises. You can't compute with them, either.

If by now I sound like a confirmed reactionary bewailing the march of time, let me set the record straight. We can't go back to the past, nor can we hold onto the present. As old methods of doing things become outmoded, new ones are found to replace them. More often than not, the results are actually an improvement. Hurrah for progress! We can do more for less, as Bucky Fuller would say, and that means we must be doing better.

But a better concept does not always immediately mean a better product, and this is the point to be noted well, especially amid the excitement and hoopla of a major trade convention. Salesmen are expert at pointing out the advantages of a new time, but they typically "forget" to mention any drawbacks or difficulties involved. Sales executives are often more concerned with meeting shipment schedules and delivery promises than with the quality of what goes out the door. If this is an indictment of our industry, so be it.

This may be a realistic picture of the computer industry, but it is one to give the user pause to consider when looking at a newly announced product. In some cases, he can justify considering it. But in others, it is best to wait and see. What is the difference?

A complex group of factors are involved in any purchase decision. But those who are most willing to experiment with newly announced equipment are the largest organizations, already spending millions on computer equipment and willing to try something different. They may be willing to agree to serve as guinea pigs in a vendor's development scheme if they are confident of the ultimate usability of the product by virtue of previous experience with the firm.

But that is a small minority of all users, and the rest are well-advised to wait a prudent period of time — six months or a year — before seriously considering purchase of a newly developed computer or office system.

Some firms have the support ser-

(To Preview/8)



Did you get your work out on time this month?

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'Long Look Backward' the Theme

On Pioneer Day, Luminaries Will Celebrate

By Marguerite Zientara
CW Staff

CHICAGO — A long look backward will be the theme of Pioneer Day at this year's National Computer Conference, when industry luminaries celebrate the 30th birthday of the Univac I.

On Wednesday, May 6, two sessions will be devoted to, first, memories of the pioneering work done by the Eckert-Mauchly Computer Corp. and, second, the results of that work in the form of Univac I and its impact on its first user, the U.S. Census Bureau.

Chaired by Dr. Carl Hammer, director of computer sciences for Sperry Univac, the morning session will feature four speakers who played key roles in Univac I's development at the Eckert-Mauchly firm, which later evolved into Remington Rand Univac and Sperry Univac. In "Univac Thirty Years Ago," the speakers will describe internal developments and the image they planned to create with the Univac I system.

The birth of the idea led logically from hardware to software concepts, and to a model used for marketing and servicing the initial product line of 46 copies, the first of which was acquired by the U.S. Census Bureau.

J. Presper Eckert, of the original Eckert-Mauchly team, will present an historical overview of the conceptual evolution of computer architecture and component development, following the sequence of Eniac-Edvac-Binac and culminating in the Census Bureau machine.

The production of the Univac I, Serial I — the first commercially produced electronic computer — naturally led to speculation on the very concept of a product line. Eckert will describe this process as it evolved and will discuss its influence on later generations of computers.

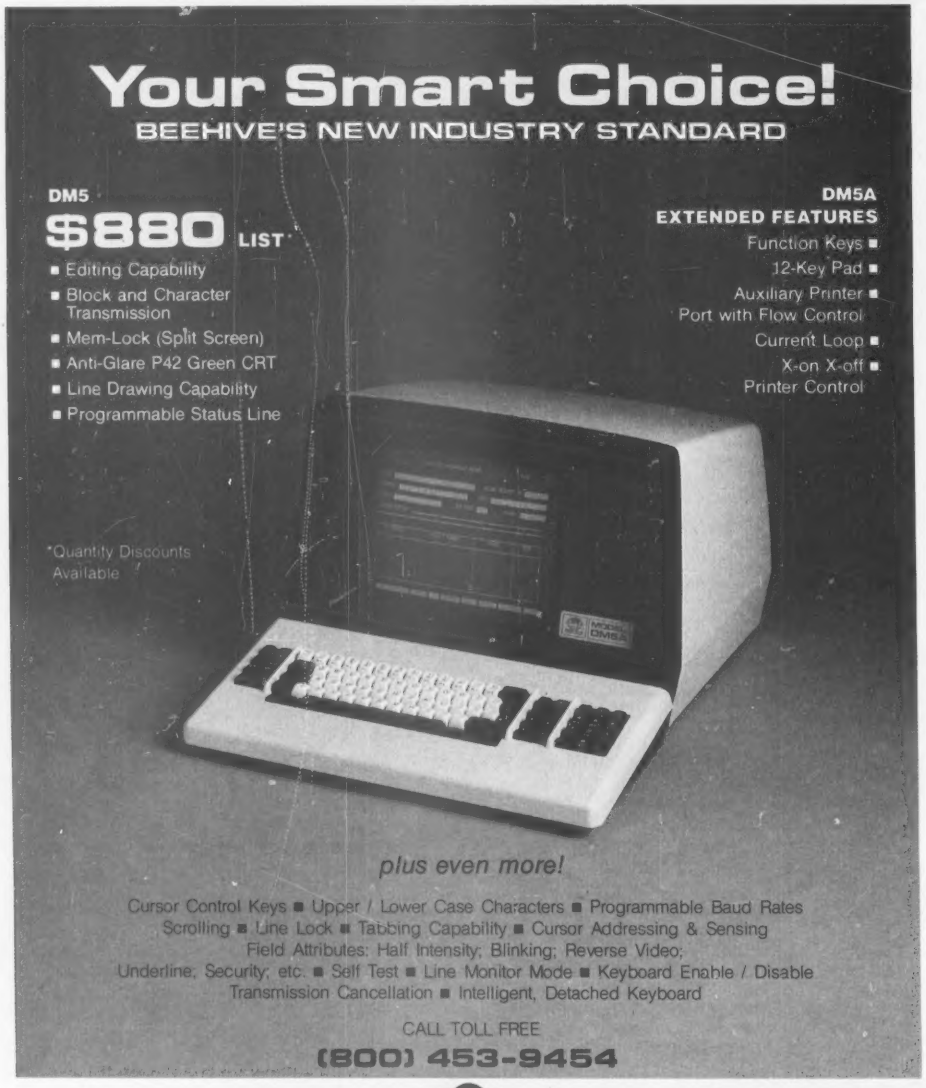
Speaking on "The Software Concept" will be Dr. Grace Murray Hopper, a captain in the U.S. Navy, whose major contributions in the writing of software laid the groundwork for many of today's programming methods.

Hopper will address the emergence of coding concepts and programming as a discipline, systems programming, utilities and applications programming. She will also discuss the contribution of high-order programming languages to the acceptance of these systems in the business and scientific/engineering communities.

Past and Future

Isaac Auerbach, now president of Auerbach Publishers, Inc., was the manager of hardware development for the Univac project. He will offer a description of his experiences in that capacity and, like all the speakers, will describe "what [he] experienced at the time and how, at that time, [he] felt about the future," according to Hammer.

Now retired, Art Draper was the director of marketing for Univac I. He is scheduled to recount what it was like creating a new sales force and selling the hitherto unknown machinery through high-level contacts. Draper will also discuss systems analysis support, pre- and postsales activities and how the most frequently used sales arguments have stood up over time. He will also contrast the model used for marketing the Univac I with that used by other



NCC Buyer: Beware Promises

(From Preview/7)

vices, including field engineers and training experts, to handle the problems of complex new system introductions smoothly. Others are apt to fumble the ball and leave the user back in the end zone — if I may borrow a bit of football language at the start of baseball season.

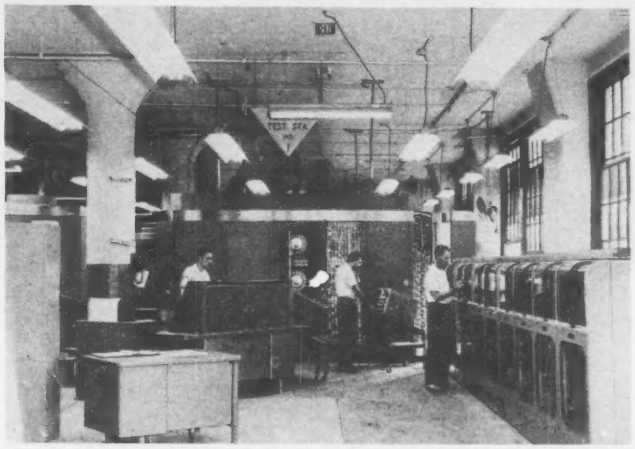
The only solution is to buy carefully after a thorough inspection of the equipment and a complete run-through of all features which are essential to the operation. In addition, one should already be acquainted with the local vendor who will support the installation.

Finally, if all else fails and despite all precautions an excessive number of problems occur on installation, one must not be too hesitant to pull the plug on the system. You are the final judge, and you should reject and remove the equipment, if necessary, before it threatens to torpedo your organization with its poorly implemented solutions.

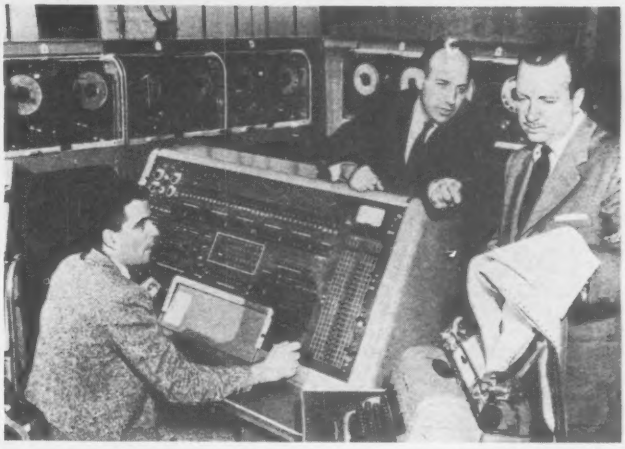
Segal is president of the Association of Computer Users, a nonprofit association with members all over the U.S., Canada and several other foreign countries. The association can be reached through P.O. Box 9003, Boulder, Colo. 80301.

Memories of Eckert-Mauchly

Univac I's 30th Anniversary — and Reminisce



This picture was taken in the Remington Rand manufacturing facilities in Philadelphia in the early 1950s.



Photos Courtesy of Sperry Univac

Leslie Groves, then Remington Rand vice-president, points at console.

companies, as well as the importance of service.

The afternoon session, "The World Around Univac I," will present a group of panelists who will describe their perceptions of Univac's early marketing efforts. Introduced by Dr. Nancy Stern, Chairman of the Department of Administrative Computer Systems at Hofstra University, who will briefly discuss "Historical Perspectives," the five panelists will review the steps that led to the first contract for Univac I, will recall the use of the computer for projecting the results of the 1952 presidential election and will present an historical overview showing the effect of Univac I on Census philosophy.

Arthur C. Nielsen, chairman of A.C. Nielsen & Co., of "Nielsen Ratings" fame, will address "How the Nielsen Corporation Almost Became the First Univac I User," including what was expected from the machine, how it was represented to the firm and the reasons for not placing the first order.

The President Emeritus of City University of New York's Graduate School and University Center, Dr. Mina Rees, was in charge of the selection committee that selected the Univac I for three organizations: the Census Bureau, the U.S. Air Force System in the Pentagon and the U.S. Army Map Service.

Rees will discuss her evaluation team, the selection process, the signing of the contract and the outcome of the transaction. She will also describe the process of monitoring the design and development through the National Bureau of Standards, as well as acceptance tests that were run, and the official dedication of Univac I, Serial Number 1, on June 14, 1951. And with the wisdom of hindsight, Rees will speculate on what might have been done differently.

One of the early, spectacular uses of the machine was to predict the outcome of the 1952 presidential election. Charles Collingwood, CBS News correspondent, who was on the scene of that early, televised projection, will present the rationale behind the project, its expected results and how it was to be conducted. Collingwood will then recount the actual experience of Election Night, as "Machine vs. Man."

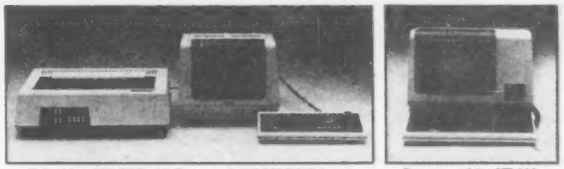
The current associate director of the Census, Daniel B. Levine, will give attendees an historical overview of Univac I's first user, including early census data gathering (1800-1890), the impact of the Hollerith machine and its successor (1890-1950), Univac I and the changes it brought to Census philosophy (1950-1980) and a vision of the future (1981-2000).

Winding up the session will be Dr. Henry Tropp, of the Department of Computer Science at the University of San Francisco, who will present an "Historical Summary." The summary will include the meaning of Pioneer Day, the structured program approach to computing and future directions for meaningful research.

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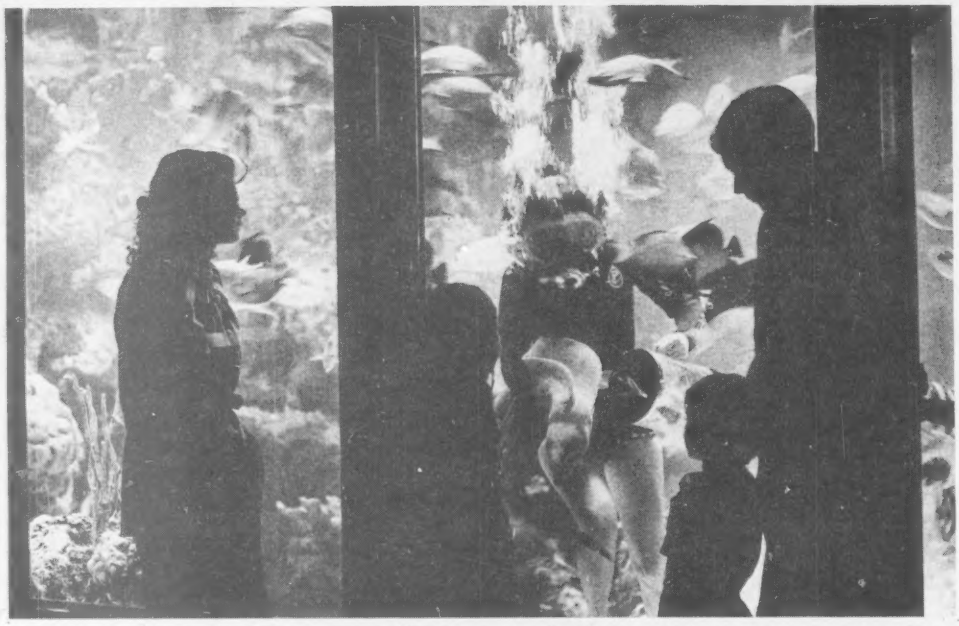
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Chicago's Museums: Try Walking Around — Inside a Human Heart

By Deborah Wise
CW Staff

CHICAGO — The computer may be the machine of the moment, the industry tool you will all come to Chicago to see, but when you are here it would be well worthwhile to look into some of the other exhibitions the city has to offer.

Chicago boasts the world's largest aquarium, a fine planetarium, world-famous museums and art galleries, a zoo, acres of park space for picnics and monuments by such famous architects and artists as Frank Lloyd Wright, Chagall and Picasso.



A fearless scuba diver offers food to a moray eel in the Coral Reef exhibit at the John G. Shedd Aquarium. Visitors can watch divers plunge into the 90,000-gallon tank twice a day to feed hundreds of fish.

• MUSEUM OF SCIENCE AND INDUSTRY •

Have you ever been down a coal mine, toured a World War II German submarine or seen a 16-foot human heart? Probably not. But they're all here and more for the inquisitive visitor. The museum emphasizes learning by experience.

You can descend the main shaft of a full-size reproduction of a typical Southern Illinois coal mine on a real hoist and go by electric cars to the working face. Tour guides explain the different techniques of mining past and present.

The U-505 German submarine was the first enemy war vessel boarded and captured on the high seas by the U.S. Navy since 1815. Visitors can tour the submarine and see the official films of the 1944 capture.

A 16-foot heart? You can go inside the giant model and find out how the circulatory system functions.

The museum has countless other exhibits that allow visitors to try out and test different world phenomena. Can you hear as well as a bat? Are you color blind? What is color and how do televisions mix the primary colors? How do telephones work?

All these questions and more are answered visibly and experimentally. The museum is great not only for children, but for anyone interested in the way the world works and has worked over the centuries.

SPECIAL EXHIBITION: *During the week of May 4-10 there will be an Exceptional Children's Week featuring demonstrations by handicapped children of their art works and projects.*

The Museum of Science and Industry is open 9:30 a.m. to 4 p.m. Monday through Friday and 9:30 a.m. to 5:30 p.m. Saturday and Sunday. Admission is free, though there are charges for certain exhibits: Coal Mine and U-505 submarine, 75 cents for adults and 50 cents for children under 13 years.

The museum is located at 57 St. and Lake Shore Drive. Call 684-1414 for more information.

• FIELD MUSEUM OF NATURAL HISTORY •

The world didn't start with man and his inventions. The Field Museum's huge exhibit halls and galleries are filled with clues and insights into the distant past, a past inhabited by dinosaurs and pterodactyls when plant life was just emerging.

The skeletal remains of such ancient beasts as the *Gorgosaurus* dinosaur and Neanderthal man are on display, along with a giant taxidermic exhibit of African fighting bull elephants. Examples of utensils and artifacts trace the history of the ancient Egyptian, Etruscan, Tibetan and Chinese civilizations. Gemstones and geological specimens that come from the corners of the universe explain the make-up of the world itself.

The museum is open daily at 9 a.m. and closes between 4 p.m. and 5 p.m. Admission charges are $4 for a family group, $2 for adults and $1 for children and students. Admission is free on Friday, when the museum closes at 9 p.m.

The Field Museum of Natural History is located at Roosevelt Road and Lake Shore Drive. Call 922-9410 for more information.

• THE ART INSTITUTE OF CHICAGO •

This internationally famous museum has a collection of French Impressionist and Post-Impressionist paintings that rivals the Louvre Museum in Paris.

In addition to this, gallery after gallery chronicles the history of art and includes a fine collection of Japanese prints, Chinese sculptures and bronzes.

The Thorne Rooms are devoted to miniature reproductions of the interior designs of American and European rooms from the 13th century to the present.

And in contrast to these miniatures, on view at the end of Gunsaulus Hall are the *America Windows*, monumental stained-glass windows designed by Marc Chagall.

SPECIAL EXHIBITS: *From April 30-May 16 the Institute will present the Master Drawings of Pablo Picasso.*

(To Preview/12)

CICS/VS, MVS, TSO/SPF ...?

If you only see a question mark when someone mentions CICS, MVS, VSAM, or TSO/SPF it may be time to find out more about these state of the art topics. Keeping up with these topics will also help you keep ahead of the current rate of inflation. At SOFTWARE INTELLIGENCE LABORATORY's education facility you will learn all that is required to begin design and coding of CICS/VS applications in macro and command level. However, the SIL approach goes one step further than other conventional courses. In addition to teaching in a lecture environment we provide "hands on" programming workshops using TSO/SPF for program development in an MVS environment with testing and debugging using CICS/VS R1.5. Our students are taught VSAM from the outset of the course to eliminate the cloud surrounding this topic.

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A KEY TO NCC

Chicago Downtown

Attractions

1 **Adler Planetarium** (L-6) S. Lake Shore Dr., 322-0300, 322-0304. Explore the universe through multi-media sky shows several times a day. Open daily year round with extended evening hours in summer. A. - $2.00, C. - $1.00, Senior Citizens - Free (Children should be six years or older to enter Sky Show)

2 **American Police Center & Museum** (K-3) 1130 S. Wabash, 431-0005. Displays on law enforcement history. Open Mon.-Fri. Groups by appointment. One week advance notice for group tours. Free

3 **Art Institute of Chicago** (H-4) Michigan & Adams, 443-3500. Famous for French impressionist paintings, oriental works, prints, drawings. Open daily except Christmas. A. - $2.50, C. - $1.50 Thurs. Free

4 **Field Museum of Natural History** (L-5) Roosevelt Rd. & Lake Shore Dr., 922-9410. 10 acres of natural history exhibits from pre-historic to space age. Open daily except Christmas and New Year's Day. A. - $2.00, Fam. - $4.00, C. - $1.00. Students with I.D. - $1.00, Senior Citizens, - $.50. Free to military, teachers, - Friday, Free

5 **Museum of Contemporary Art** (E-4) 237 E. Ontario, 280-2660. Latest in modern art works including music, dance, theatre, and films. Open daily except Mon. A. - $2.00, Students and Senior Citizens - $1.00

6 **Newberry Library** (C-3) 60 W. Walton, 943-9090. Research Library in the humanities with special exhibits. Open Tues.-Sat. Free.

7 **John G. Shedd Aquarium** (K-6) 1200 S. Lake Shore Dr. 939-2426. Underwater creatures displayed in their natural habitats. Daily fish feedings in Coral Reef Tank. Open daily except Christmas and New Year's Day. A. - $2.00, Fam. - $4.00, C. - $1.00. Students and Senior Citizens - $.50

8 **Goethe Institute Chicago** (E-4) 401 N. Michigan, 329-0915. German cultural center with exhibits, lectures, films, classes and library. Open Mon.-Fri. Free. Two weeks advance notice for group tours.

9 **Telephone Museum** (G-2) 225 W. Randolph, 727-2994. History of telephone development from Alexander Bell to communications of the future. Open daily. Free

Sights and Sounds

10 **Auditorium Theatre** (J-3) 50 E. Congress Pkwy., 922-2110. Concerts and musical performances seating 4,000. Tours for groups of ten or more.

11 **Bertoia Sculpture/Standard Oil Building** (G-4) 200 E. Randolph. "Sounding sculpture" set in reflecting pool in front of world's second tallest building.

12 **Board of Trade of the City of Chicago** (H-2) 141 W. Jackson Blvd., 435-3626. Largest commodities futures market in U.S. 20 minute tours twice every hour, Mon.-Fri. Groups of 15 or more must make reservations two weeks in advance.

13 **Buckingham Fountain** (J-5) Grant Park & Congress Expwy. World's largest fountain, operated May through Sept., 9 p.m. color light display.

14 **Calder Sculpture** (H-3) Federal Center Plaza, Adams & Dearborn. 53 Ft. high "Flamingo" stabile by Alexander Calder.

15 **Chagall Mosaic** (G-3) First National Plaza, Monroe & Dearborn. "Four Seasons" mosaic by Marc Chagall. Summer noon-time musical events, outdoor cafe.

16 **Chicago Public Library Cultural Center** (G-4) Michigan & Washington, 269-2800. Interior features Tiffany domes, mosaics. Year round special events and exhibits. Free. Group tours two weeks advance notice.

17 **Exchange National Bank** (H-2) LaSalle & Adams, 781-8000. Permanent collection of photography. Mon.-Fri. Free. Group of fifteen or more should make two week advance notice for tours.

18 **Fort Dearborn Site** (F-4) South of Michigan Ave. bridge, site of Chicago's first settlement now occupied by Stone Container Building.

19 **Illinois Travel Information Center** (F-4) 208 N. Michigan Ave., 793-2094. Open Mon.-Fri., 9 a.m.-5 p.m.

20 **Loyola University** (D-4) 820 N. Michigan, 670-2820. Oldest university in Chicago, downtown campus. Group tours for students only.

21 **Petrillo Music Shell** (H-4) Columbus Dr. & Jackson, 294-2420. Free outdoor concerts late June-August, Wed., Fri. 8 p.m., weekends 7 p.m.

22 **John Hancock Center** (C-4) 875 N. Michigan, 751-3681. Tallest residential office building in world. Observatory open daily 9:00 a.m.-midnight. A. - $2.00, - Senior Citizens $1.50. Group rates available

23 **LaSalle Street** (G-2 to H-2) From Jackson to Washington. Heart of Chicago's financial district.

24 **Marina City** (F-3) Dearborn & Chicago River. Twin 60-story towers contain complete self-sufficient living and working environment.

25 **Monadnock Building** (H-3) 53 W. Jackson. World's largest office building in 1893 and still highest commercial building with outside walls of masonry construction.

26 **Orchestra Hall** (H-4) 220 S. Michigan, 435-6122. Home of the Chicago Symphony Orchestra and setting for numerous musical events.

27 **Picasso Sculpture** (G-3) Richard J. Daley Plaza, Dearborn & Washington. Untitled sculpture 50 ft. high, a gift to the city from Picasso. Summer noontime events.

28 **The Rookery** (H-2) 209 S. LaSalle. Oldest remaining steel skeleton skyscraper built in 1886.

29 **Roosevelt University** (J-4) Michigan & Congress. University founded in 1945 occupies old Auditorium Hotel, social center of the 1893 World's Fair.

30 **Rush Street** (B-3 to D-3) Chicago Ave. north to Division. Chicago's lively nightime entertainment district.

31 **Sears Tower** (H-1) Wacker Dr. & Jackson, 875-9696. World's tallest building at 110 stories. Observatory open daily 9 a.m. to midnight. A. - $1.50, C. - $1.00, Senior Citizens - $1.50 (must purchase tickets for observatory deck before 11:30 p.m.)

32 **State Street** (F-3 to H-3) "That Great Street," has one of the greatest concentrations of world famous department stores including Marshall Field's, Carson Pirie Scott, Sears and others.

33 **Water Tower Visitor Information Center** (D-4) Chicago & Michigan Ave., 225-5000. Located in Historic Water Tower, open daily, multi-lingual staff, direct telephone lines for public transportation, eventline, cultural events, hotel and restaurant reservations.

34 **Water Tower Place** (D-4) 835 N. Michigan. Seven level atrium shopping mall with major department stores, specialty shops, restaurants and theatres.

AUDITORIUMS, THEATRES, EXHIBITION HALLS

35 **Navy Pier** (E-6) Grand & Lakefront, 744-5000. Site of numerous special event activities including ChicagoFest every August.

36 **ExpoCenter/Chicago** (E-1) Orleans & Kinzie, 527-4141. In the Apparel Center offering more than 140,000 square ft. of exhibition space.

37 **Merchandise Mart** (E-2) Wells & Kinzie, 427-4141. World's largest commercial-wholesale buying center with the equivalent of 97 acres of floor space.

38 **McCormick Place-on-the-Lake** (O-6) 23rd and South Lake Shore Dr., 791-6000. Offering 780,000 sq. ft. of exhibition space on three levels including banquet halls, theatres, and press complex.

39 **McCormick Place West** (O-5) 23rd and South Lake Shore Dr., 791-6000. More than 400,000 sq. ft. of exhibition space on three floors and two mezzanines.

40 **Opera House** (G-1) Madison & Wacker Dr., 346-0270. Home of the Lyric Opera seating more than 3,500.

41 **Arie Crown Theater** (O-6) McCormick Place, 23rd and South Lake Shore Dr., 791-6500.

42 **Blackstone Theater** (J-4) 60 E. Balbo, 977-1700.

43 **Drury Lane East** (0-6) McCormick Place, 23rd and South Lake Shore Dr., 791-6200

44 **Drury Lane Water Tower** (D-4) 175 E. Chestnut, 266-0600.

45 **First Chicago Center** (G-3) One First National Plaza, 732-4067.

46 **Shubert Theater** (G-3) 22 W. Monroe, 977-1700.

47 **Studebaker Theater** (J-4) 418 S. Michigan, 435-0700.

SIGHTSEEING TOURS

48 **American Sightseeing** (J-4) 530 S. Michigan, 427-3100. Offering a variety of bus tours daily.

49 **ArchiCenter** (H-3) 310 S. Michigan, 728-1776. Walking tours Mon.-Sat.

50 **Gray Line Tours** (H-3) 33 E. Monroe, 346-9506. Bus Tours of city offered daily.

51 **Merchandise Mart/Apparel Center** (E-1) 661-1440. Tours Thurs. 10 a.m. and 1:30 p.m. except during wholesale markets and mid-Dec. to mid-Jan.

52 **Mercury Boat Tours** (F-4) Michigan & Wacker Dr., 332-1353. River and lakefront tours May-September, several times daily.

53 **Priority Air Sightseeing Tours** (M-6) Meigs Field, 15th St. and S. Lake Shore Dr., 922-0503. April-September tours daily.

54 **Wendella Sightseeing Boats** (F-4) Michigan Ave. bridge, 337-1446. April-September river and lake cruises daily.

GROUP TOURS

55 **American National Bank & Trust** (G-2) LaSalle & Washington, 661-5897. Tours Mon.-Fri. except holidays.

56 **Chicago Architecture Foundation - Glessner House** (N-4) 1800 S. Prairie, 326-1393. 10 person minimum, can accommodate walking, bike or bus tours. Discount for subscription members. Walking, $2.50 per person; Bus, $5.00 plus cost of bus divided between number of people.

57 **ArchiCenter** (H-3) 310 S. Michigan, 782-1776. Variety of tours by bus, walking, bicycle, Mon.-Sat.

58 **Chicago Police Department** (K-3) 1121 S. State, 744-5571. No one under 12 admitted on tours. 10:30-1:30 p.m. Mon.-Fri. Group tours advance notice.

59 **Chicago Post Office** (H-1) 433 W. Van Buren, 886-3660. 2 hour tours, Mon.-Fri. except in December. Group tours of 40 or more should make 1-2 week advance reservations.

60 **Chicago Sun-Times** (F-3) 401 N. Wabash, 321-2032. 45 minute tours. Group tours of 40 should make 1-2 week advance reservations. 9:30 and 10:30 a.m.

61 **Chicago Tribune** (E-4) 431 N. Michigan, 222-3993. 80 minute tours, Mon.-Sat. Several tours daily. Group max. 70, should make 1 month advance reservations.

62 **City Hall** (G-2) 121 N. LaSalle, 744-5000. City government tours. Department of neighborhoods Mon.-Fri. Tours by reservations only.

63 **First National Bank of Chicago** (G-3) Dearborn & Madison, 732-6037. 45 minute tours Mon.-Fri. group max. 30. Children should be 12 years of age and older.

64 **International Monetary Market & Chicago Mercantile Exchange** (H-1) 444 W. Jackson, 648-1000. Trading activity tours Mon.-Fri. Group max. 60.

65 **Merchandise Mart/Apparel Center** (E-1) 661-1440. Tours of Mart and Apparel Center by reservation only. Special group rates.

66 **Marshall Field & Company** (G-3) State & Washington, 781-4781 or 781-4461.

67 **Quaker Oats Test Kitchen** (E-2) Merchandise Mart, 222-6809 Tours Mon.-Fri.

RAIL STATIONS

68 **LaSalle Street Station** (H-2) LaSalle and Van Buren Sts.

69 **Northwestern Station** (G-1) Canal and Madison Sts.

70 **Illinois Central Station** (G-4) 151 East Randolph

71 **Union Station** (H-1) Canal and Adams Sts

BUS TERMINALS

72 **Greyhound Terminal** (G-3) Clark and Randolph Sts., 781-2900

73 **Continental Trailways Depot** (G-3) 20 East Randolph St., 726-9500.

Public Transportation

Chicago Transit Authority (CTA) Bus, subway and elevated service, 836-7000

Regional Transportation Authority (RTA) Bus service, 836-7000

Airports

O'Hare International Airport, Mannheim Rd. and the Kennedy Expy.

Midway Airport 5700 S. Cicero

Meigs Field lakefront just south of the loop.

Downtown Hotels

1 **Allerton Hotel** (D-4) 701 N. Michigan Ave., Chicago 60611, 440-1500

2 **Ambassador East** (A-3) 1301 N. State Pkwy, Chicago 60610, 787-7200

3 **Ambassador West** (A-3) 1300 N. State Pkwy., Chicago 60610, 787-7900

4 **Ascot House** (K-4) 1100 S. Michigan Ave., Chicago 60605, 922-2900

5 **Avenue Motel** (K-4) 1154 S. Michigan Ave., Chicago 60605, 427-8200

6 **Best Western Lake Shore Drive** (E-5) 600 N. Lake Shore Dr., Chicago 60611, 787-4700

7 **Bismarck Hotel** (G-2) 171 W. Randolph St., Chicago 60601, 236-0123

8 **Blackstone Hotel** (J-4) 636 S. Michigan Ave., Chicago 60605, 427-4300

9 **Chicago Downtown Travelodge** (L-4) 1240 S. Michigan Ave., Chicago 60605, 427-4111

10 **Chicago Marriott** (E-4) 540 N. Michigan Ave., Chicago 60611, 836-0100

11 **Conrad Hilton** (J-4) 720 S. Michigan Ave., Chicago 60605, 922-4400

12 **Continental Plaza** (C-4) 909 N. Michigan Ave., Chicago 60611, 943-7200

13 **Drake Hotel** (C-4) 140 E. Walton St., Chicago 60611, 787-2200

14 **Essex Inn** (K-4) 800 S. Michigan Ave., Chicago 60605, 939-2800

15 **Executive House** (F-4) 71 E. Wacker Dr., Chicago 60601, 346-7100

16 **Holiday Inn City Centre** (E-5) 300 E. Ohio, Chicago 60611, 787-6100

17 **Holiday Inn Downtown** (G-1) Mid-City Plaza, Chicago 60606, 829-5000

18 **Holiday Inn — Lake Shore Drive** (E-5) 644 N. Lake Shore Dr., Chicago 60611, 943-9200

19 **Holiday Inn—Mart Plaza** (E-1) 350 N. Orleans, Chicago 60654, 836-0900

20 **Hyatt Regency Chicago** (F-4) 151 E. Wacker Dr., Chicago 60601, 565-1000

21 **The Knickerbocker Chicago** (C-4) 163 E. Walton Pl., Chicago 60610, 751-8100

22 **LaSalle Motor Lodge** (D-2) 720 N. LaSalle St., Chicago 60610, 664-3100

23 **Mayfair Regent Hotel** (C-4) 181 E. Lake Shore Dr., Chicago 60611, 787-8500

24 **McCormick Inn** (O-6) 23rd & Lake Shore Dr., Chicago 6l 616, 791-1900

25 **Midland Hotel** (H-2) 172 W. Adams St., Chicago 60603, 332-1200

26 **Ohio House** (E-2) 600 N. LaSalle St., Chicago 60610, 943-6000

27 **Oxford House** (F-3) 225 N. Wabash Ave., Chicago 60601, 346-6585

28 **Palmer House** (H-3) 17 E. Monroe St., Chicago 60690, 726-7500

29 **Park Hyatt on Water Tower Square** (D-4) 800 N. Michigan Ave., Chicago 60611, 943-5800

30 **Pick Congress (Americana Congress)** (J-4) 520 S. Michigan Ave., Chicago 60605, 427-3800

31 **Radisson Chicago** (E-4) 505 N. Michigan Ave., Chicago 60611, 944-4100

32 **Ramada Inn—Downtown** (J-1) 506 W. Harrison St., Chicago 60607, 427-6900

33 **Raphael Hotel** (C-4) 201 E. Delaware Pl., Chicago 60611, 943-5000

34 **The Richmont** (E-4) 162 E. Ontario, Chicago 60611, 787-3580

35 **Ritz-Carlton** (D-4) 160 E. Pearson, Chicago 60611, 266-1000

36 **St. Clair Hotel** (E-4) 162 E. Ohio St., Chicago 60611, 787-4980

37 **Sheraton Plaza** (D-4) 160 E. Huron St., Chicago 60611, 787-2900

38 **Travelodge in the Heart of Chicago** (E-2) 545 N. LaSalle St., Chicago 60610, 467-0800

39 **Tremont Hotel** (C-3) 100 E. Chestnut, Chicago 60611, 751-1900

40 **Twenty East Delaware** (C-3) 20 E. Delaware, Chicago 60611 944-4970

41 **Whitehall Hotel** (C-4) 105 E. Delaware Pl., Chicago 60611, 944-6300

* **Chicago Convention and Tourism Bureau** (O-6) McCormick Place-on-the-Lake Chicago, 60616/225-5000



Chicago Convention and Tourism Bureau, Inc.
McCormick Place-on-the-Lake • Chicago, Illinois 60616 • 312-225-5000

More Than One Show in Town

(From Preview/10)

The Art Institute of Chicago is open from 10:30 a.m. to 4:30 p.m. Monday, Tuesday, Wednesday and Friday; 10:30 a.m. to 8 p.m. on Thursday; 10:30 a.m. to 5 p.m. on Saturday and noon to 5 p.m. on Sunday. The admission fee is discretionary, with a suggested $2 charge for adults and $1 for students. Call 443-6000 for more information.

• MUSEUM OF CONTEMPORARY ART •

The museum offers a variety of contemporary, avant-garde works and is presenting *Permanent Collection: Artists' Books* as a special exhibit March 31-May 31.

The museum is open from 10 a.m. to 5 p.m. Tuesday through Saturday and noon to 5 p.m. on Sunday. Admission is $2 for the general public and $1 for students.

The museum is located at 237 E. Ontario St. Call 280-2660 for further information.

• THE ADLER PLANETARIUM •

If you don't want to keep your feet on the ground and you would rather be up there with the stars, then a trip to the Adler Planetarium is a must.

Located on four levels, this astronomical exhibition allows visitors to look at the world above through telescopes and prisms as well as offering a spectacular audio-visual sky show that explains the movement of the planets and the stars.

SPECIAL EXHIBITION: *Marking the 50th anniversary of the Adler Planetarium is a special exhibition running from March 18-June 9 titled "Man Enters the Cosmos." This traces the history of man's attempt to voyage into space from the 1926 liquid-fueled rocket that took off from a Massachusetts hillside to the Apollo 11 voyage, when man first walked on the moon.*

The planetarium is open daily from 9:30 a.m. to 4:30 p.m. and until 9 p.m. on Friday. Sky Show times are at 2 p.m. on Monday through Thursday and at 2 p.m. and 8 p.m. on Fridays. Admission is $2 for adults and $1 for children.

The Adler Planetarium is located at 1300 S. Lake Shore Drive. For more information call 322-0304.

• JOHN G. SHEDD AQUARIUM •

Next door to the Field Museum of Natural History, where all the animals are thankfully inanimate, is the Aquarium — one of the largest in the world. Here the animals swim around in towering fish tanks built in the round so visitors get the impression they are taking a dip themselves. The Coral Reef and the brilliant tropical fish make an astonishing display of living color. You can even see divers hand-feeding sharks and snapping turtles.

The aquarium is located in Grant Park, at 1200 S. Lake Shore Drive. For admission information and feeding times, call 939-2426.

• LINCOLN PARK ZOO •

The early spring is often one of the loveliest times of year to take a walk outside, view the blossoms and picnic. And while you are strolling through Lincoln Park, you might want to drop in on the 2,600 mammals, birds and reptiles from all over the world that now live in the Lincoln Park Zoo.

There's no admission charge and it's open most of the time. You can take a look at the new Sea Lion Pool and the Great Ape House or just go to wonder at the magnificient wild cats. The computers at the conference may seem very tame in comparison to these beasts.

And if these animals are too fierce and ferocious, you can take a more leisurely stroll through the Lincoln Park Conservatory with its Palm House, Fernery and exotic Tropical House.

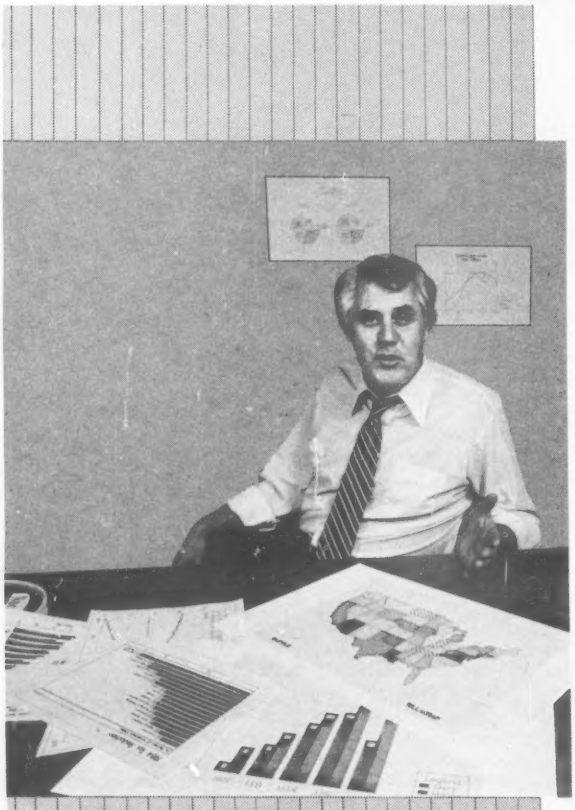
• OAK PARK •

All these sites and excitements are easily accessible from the downtown area of Chicago. Only a short distance away (10 miles from the Loop) and well worth the trip for those interested in the development of American architecture is Oak Park, the home of Ernest Hemingway and also the place where Frank Lloyd Wright developed his "prairie style" architecture.

There are over 100 examples of Frank Lloyd Wright's work in the neighborhood, including the home and studio he built for himself in 1889. He lived and worked there for 20 years designing many of his most influential buildings like Unity Temple and Farson-Mills House.

Tours are available around these buildings at different times and on different days. More information is available at the Oak Park Tour Center, 951 Chicago Ave., Oak Park, 848-1978.

Outside the McCormick exhibition hall, Chicago offers many interesting exhibitions. If the computers begin to get you down or you have an extra day to spend in the city try to take advantage of these special attractions.



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French, Famous And Fancy

By Maggie Kast
Special to CW

A handful of classic French restaurants in Chicago are among the best in the country, starting with Le Francais, owner-chef Jean Banchet's temple of nouvelle cuisine in suburban Wheeling. This fine establishment is definitely worth the trip.

Just as good and closer is Le Perroquet, where Jean Banchet likes to go for dinner. You have to pay for this quality: $100 and up for two at Le Francais; $75 and up for two at most of the restaurants in this group. Reservations are required well in advance.

• **Cricket's**, Tremont Hotel, 100 E. Chestnut, 280-2100. Elegant, in spite of overdone pop decor. Comfortable bar; extensive, all a la carte menu, fine French food. Oysters baked in Pernod are outstanding.

• **La Fontaine**, 2442 N. Clark, 525-1900. Classic French cooking in a remodeled Lincoln Park townhouse.

• **Le Francais**, 269 S. Milwaukee, Wheeling, 541-7470. Every dish an invention of the chef and everything made from scratch. Freshest and best ingredients garnered from all over the world. Presentation of dishes at tableside before you order is a unique feature. Allow three hours and give your full attention to this peak dining experience.

• **Jovan**, 16 E. Huron, 944-7766. Prix fixe of $22 includes dessert souffles; orated menu lists eight to 10 appetizers and the same number of entrees. Soup and salad also included.

• **Maxim's de Paris**, 1300 N. Astor, 943-1111. Turn-of-the-century elegance and comfortable intimacy in this echo of the Parisian original. A la carte menu permits you to go for

(To Preview/17)

Dining in Chicago

Chicago is an exciting place to eat, with well over 200 high-quality establishments in the area. Because space prohibits a comprehensive survey, this is a selective list of personal favorites (and a few personal dislikes), with emphasis on the lunching and dining needs of National Computer Conference attendees.

With a few exceptions, the restaurants listed here are close to McCormick Place or the North Michigan Avenue hotels. This has meant excluding the suburban restaurants, many of which are famous and excellent (only Le Francais is listed).

Hours vary and menus change; we suggest a call in advance to any restaurant you plan to visit. Some of the best places require reservations weeks ahead — Chicago's area code is 312.

— Maggie Kast

Maggie Kast is a freelance restaurant reviewer living on Chicago's South Side with her husband and four children.

For 20 years a dancer, choreographer and artistic director of Chicago's first modern dance company, Kast has turned the dancer's interest in foods and cooking into a second career. She has been doing research and reporting on Chicago's restaurants for the past two years and now has her own column in the Hyde Park Herald, *Chicago's oldest community newspaper.*

With a special interest in Chicago's ethnic neighborhoods and cooking traditions, and with a firm adherence to the consumer point of view, Kast also loves the most sophisticated cooking styles and says she hopes to increase knowledgeable appreciation of them.

Future plans include a trip to Vienna and reporting on the restaurant scene there.

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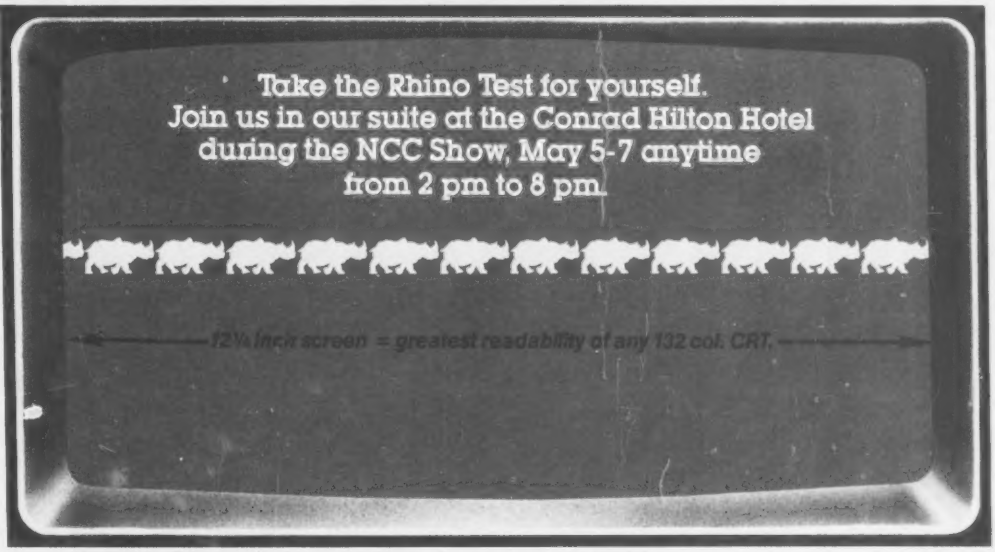
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Famous But Not Recommended

By Maggie Kast
Special to CW

You don't have to take second best when you're dining out in the Second City — if you go into a restaurant you should expect top value, outstanding quality, or both. Reputation is not necessarily a guarantee of excellence, and many smaller or less well-known restaurants are much more exciting than some of the famous ones.

Some of the establishments on this list are new places that need time to develop consistency; some are competent but ordinary hotel dining rooms; some use snob appeal to get away with rip-off prices and some treat their customers with insolence.

• **Le Ciel Bleu**, Mayfair Regent Hotel, 181 E. Lake Shore Drive, 951-2864. Sloppy, careless service and inconsistent cooking make this a disappointment for which you pay up to $100 per couple. View and decor are spectacular.

• **Ninety-Fifth and Images Lounge**, 1782 E. Chestnut, 787-9596. This beautiful setting on top of the John Hancock Building is a great place to go for a drink and the view. Cocktails are $2.75 until 8 p.m., $3.25 after that. Menu changes are in progress at the restaurant. At present, table d'hote "sunset" dinners are served from 5:30 p.m.to 7 p.m. .ly for $9.95 to $13.75. The regular menu is all a la carte, expensive, pretentious and limited. You can easily walk to someplace much better.

• **The Palm**, 181 E. Lake Shore Drive, 944-0135. Chicago's new edition of the chain based in New York and extending to Los Angeles. Waiters push food at very high prices ($100 for large lobsters) and treat customers with condescension.

• **Palmer Steak House**, Palmer House Hotel, State and Monroe, 726-7500. Like many others, this hotel dining room has not yet been hit by the new wave in dining — commercially prepared and frozen ingredients are used; the menu is uninteresting and service is careless.

• **Paradise Cafe**, 3352 N. Broadway, 348-8454. This popular, award-winning restaurant has off nights. Hit one of them, and you will be infuriated by slow service and food which is not as described. On a good day, happy crowds enjoy interesting, casual food with gusto.

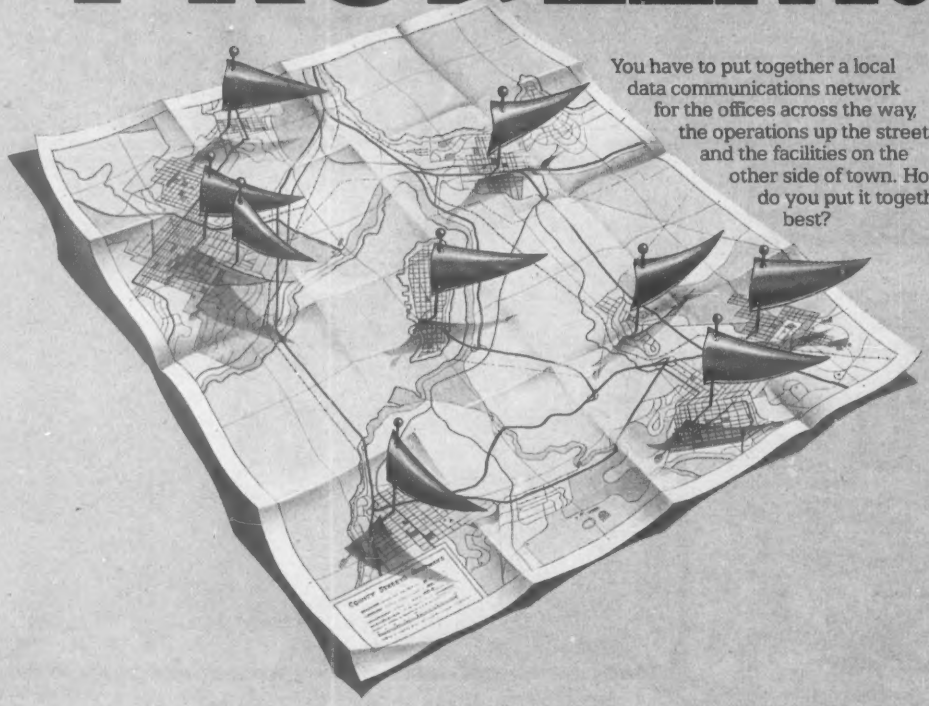
• **La Tour**, Park Hyatt Hotel, 800 N. Michigan Ave., 280-2230. A new, beautifully decorated classic French restaurant. Needs time to develop food quality consistently equal to $60 per couple tab.

• **Truffles**, Hyatt-Regency Hotel, 151 E. Wacker Drive, 565-1000. At $120 for two for food, lapses in service make you feel ripped off, in spite of good cooking.



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PROBLEM:



You have to put together a local data communications network for the offices across the way, the operations up the street, and the facilities on the other side of town. How do you put it together best?



Solid Quality, Top Value

By Maggie Kast
Special to CW

You don't have to pay an arm and a leg to have a good dinner in an interesting environment. These places are reliable, enjoyable, casual spots where the check for two will be $40 or less — sometimes quite a bit less.

• **The Berghoff**, 17 W. Adams, 427-3170. One of Chicago's best-known and loved restaurants, serves homestyle German food in ample portions at low prices. Can be noisy and tumultuous when busy.

• **La Creperie**, 2940 N. Clark, 528-9050. Entree and dessert crepes at low prices.

• **Court House**, 5211 S. Harper, 667-4008. At McCormick Place you are half way between the Loop and Hyde Park, where the Court House looks out on Harper Court, an interesting two-tiered square of small shops and galleries. Beef fondue is a speciality, and the garlic-Parmesan salad dressing is great. Lots of omelettes and interesting vegetarian dishes, too.

• **D.B. Kaplan's Delicatessen**, Seventh floor, Water Tower Place. Deli atmosphere doesn't make for an intimate evening, but the food is great: sandwiches, salads, egg dishes, quiches and deli plates from a three-foot-long menu. Good ice cream concoctions for dessert.

• **Mallory's**, 1525 E. 53, 241-5600. In Hyde Park, in a wonderful two-story-high room on the 10th floor of a bank building; carved wooden ceiling beams and nice view. Small menu is continental; food quality may be uneven.

• **Magic Pan**, 60 E. Walton, 943-2456. This edition of a national chain serves excellent crepes in a plant-filled, light, gay atmosphere. Nice combinations with soup and salad are offered to make a meal.

• **The Theatre Cafe**, Second floor, Water Tower Place, 943-8443. Soups, salads and sandwiches, plus ice cream dishes made with Haagen-Dazs. Yogurt fondue is choice of fruit served with soft frozen vanilla yogurt. For a later snack, open until midnight weekdays and 1 a.m. Fridays and Saturdays.

• **2350 Restaurant and Pub**, 2249 N. Lincoln, 281-9859. This friendly, busy neighborhood pub serves food at all hours from a large and varied menu including salads, omelettes, sandwiches, entrees and ice cream desserts (made with Vala's). Not every item will always be great, but it's a nice place to be, and the prices are reasonable.

SOLUTION:



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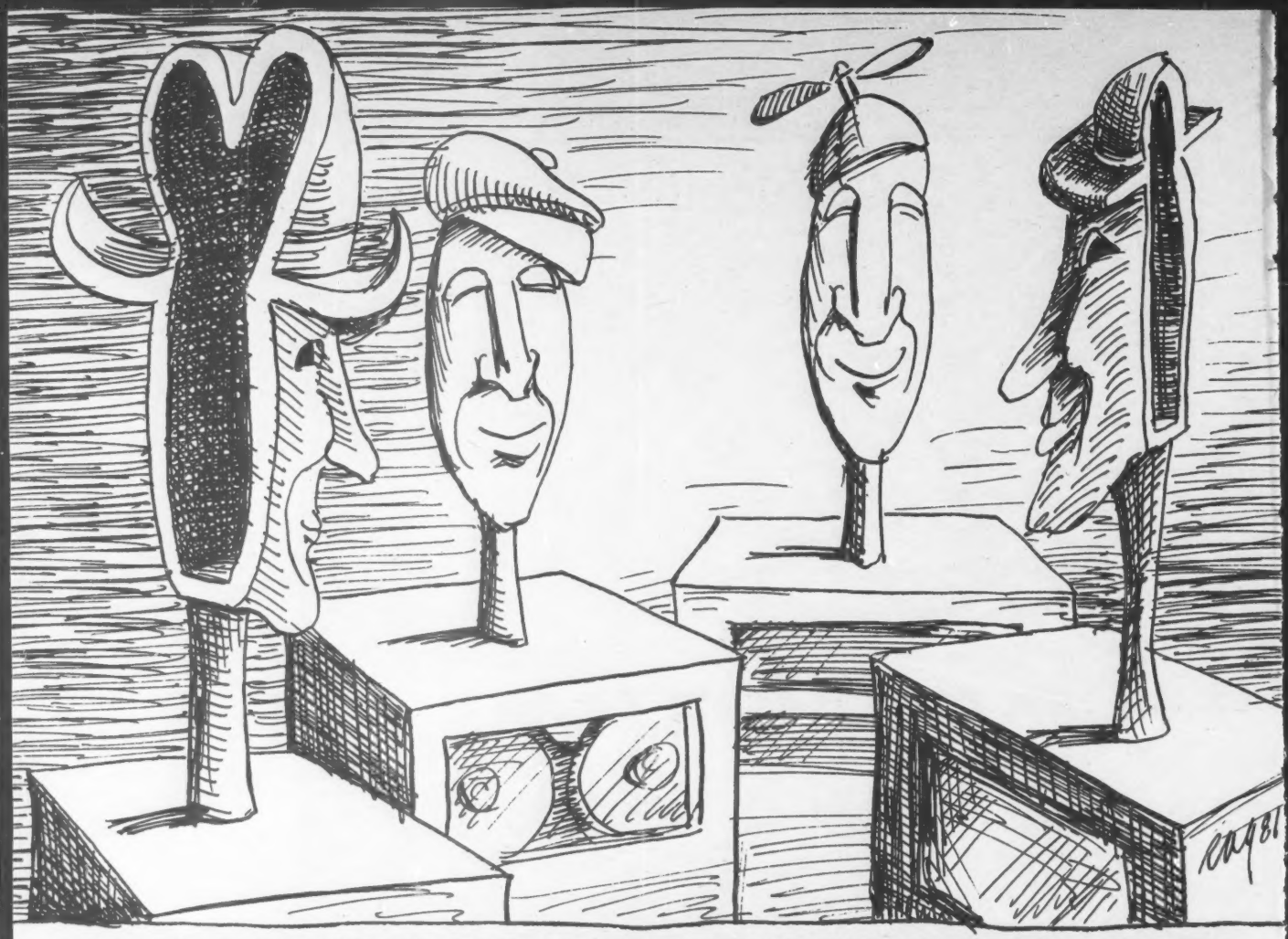
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Indian

Chicago has an excellent, centrally located Indian restaurant, and it is a good place to go for initiation into this cuisine:

• **Khyber India**, 50 E. Walton, 649-9060. Menu explains most dishes; combination platters are available. Tandoori chicken a speciality, as are vegetarian and nonvegetarian curries. Variety of breads is interesting.



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Youthful and Innovative

By Maggie Kast
Special to CW

These are places to go for interesting food in stylish settings, not quite as formal or expensive as the classic French ones listed on Preview/13. They showcase the work of innovative young chefs.

You will find novel combinations of cooking styles, intriguing decors and chic crowds at most of these places. All except Geja's and Hillary's recommend reservations.

• **Ambria**, 2300 N. Lincoln Park W., 472-5959. Reservations required weeks ahead at this outstanding, elegant new restaurant. Fresh fish and calf's liver with cracked mustard seeds are specialties. Seven-course, no-choice-of-food dinner is $35 and requires a day's advance notice.

• **Bastille**, 21 W. Superior, 787-2050. French brasserie with great wine bar (interesting wines sold by the glass), butcher-paper tablecloths and generally excellent grilled specialties served with French fries. Service can get confused when crowded.

• **Cafe Figaro**, 2242 N. Lincoln, 549-5755. Nouvelle cuisine in a delightful tiny restaurant, near theatres and bars on Lincoln Ave. Sidewalk cafe in good weather. Excellent fish and desserts.

• **L'Escargot**, Allerton Hotel, 701 N. Michigan, 337-1717. Blond wood, white curtains, high ceiling and overhead lighting create an airy, sparkling atmosphere in a stylish setting.

The superb cooking is cuisine bourgeoise, featuring provincial specialties. All dinners are table d'hote and an excellent value at about $19. You get two appetizers, soup, salad, entree, vegetable, dessert and coffee.

• **Gitanes**, 2350 N. Clark, 929-5500. Continental cooking in a handsome space. Good homemade desserts.

• **Gordon**, 512 N. Clark, 467-9780. Owner Gordon Sinclair and chef John Treczak have created a uniquely elegant and up-to-date restaurant with intimate, almost magical atmosphere. Carefully prepared and served food. Menu is changed daily, stresses fish and is generally nouvelle cuisine in style. Charming service is personable and helpful without being chummy.

• **Hillary's**, Mezzanine, Water Tower Place, 280-2710. Bar plus fun food in an open, inviting space with much coming and going. Deep-fried appetizers, nachos, hamburgers, omelettes.

• **Geja's**, 340 W. Armitage, 281-9101. Fondues: cheese, beef, chicken, seafood or vegetable, and chocolate for dessert. Extensive wine list. Flamenco and classical guitar nightly.

• **Jimmy's Place**, 2430 N. Elston, 539-2999. Bright, modern decor does not make for intimacy, but combination of Japanese and continental cooking styles is fascinating.

• **Sweetwater**, 1028 N. Rush, 787-5552. Known primarily as a swinging bar serving undistinguished American food, Sweetwater recently hired a new chef for Friday lunch. Further improvements in the menu may be coming.

• **Tango**, 3172 N. Sheridan, 935-0350. Innovative, elegant design by Tony Barone, who has done a number of Chicago restaurants. Friendly, informal service, outstanding fish cookery and fun extras like deep-fried potato skins and sodafountain-style desserts.



French, Famous

(Continued from Preview/13)

dessert and wine only — a nice way to enjoy the ambience without spending quite so much money. On Fridays, $30 prix fixe will bring you one of Chicago's most ambitious seafood offerings — a wide variety of appetizers and entrees including three kinds of oysters, sea urchin roe and authentic bouillabaisse.

• **Le Perroquet**, 70 E. Walton, 944-7990. Impeccable service makes you feel totally cared for in this most elegant of nouvelle cuisine restaurants. The food matches, and you can hardly go wrong with any choice on the rest of the menu.

The prix fixe for dinner is $31.75; $15.75 for lunch.

• **Ritz-Carlton Dining Room**, Ritz-Carlton Hotel, Water Tower Place, 266-1000. Ritzy in quality, ambience and price (average $35 per person for food), this restaurant's broad menu includes something to suit almost every taste.

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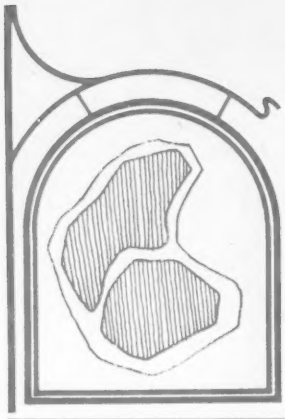
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Steak

By Maggie Kast
Special to CW

Chicago beef is famous — and rightfully so. These are all well-known, long-established restaurants where you won't find many surprises, pleasant or unpleasant.

• **House of Bertini**, 535 N. Wells, 644-1397. A three-generation, family-run, Italian steak house. Complete steak dinners from $11 to $15.75, plus fish and chicken options. Homemade ravioli and green noodles, too.

• **Lawry's - The Prime Rib**, 100 E. Ontario, 787-5000. Prime rib roast from a rolling cart and rich desserts for $20 to $25 per person.

• **Morton's**, 1050 N. State, 266-4820. Big portions of excellent steaks or lobsters, but keep track of costs — there is no printed menu, and everything is a la carte. Good souffles for dessert.

• **Blackhawk**, 139 N. Wabash, 726-0100. A Chicago staple, with high-quality steaks and prime ribs, and the much-advertised spinning salad bowl. Beef entrees from $12 to $16.50.

• **Blackhawk on Pearson**, 110 E. Pearson, 943-3300. A salad bar instead of the spinning salad bowl, otherwise essentially the same as the Blackhawk on Wabash.

Italian



Chicago's Italian restaurants run the gamut from elegant, expensive, formal places to ethnic neighborhood haunts, a few of which are included in the list below.

Northern Italian cooking is "in" these days, and most restaurants listed feature it. This does not always mean authentic specialties from the northern provinces, but it does mean many interesting dishes with a light touch and an end to thick, heavy tomato sauces.

• **Alfo's Ristorante**, 2512 S. Oakley, 523-6994. This casual, inexpensive neighborhood restaurant is located in Heart of Chicago, a small, traditional Italian enclave about five miles west of McCormick Place. Rarely found fritto misto combines chicken, veal, zucchini and artichoke hearts, all fried crisp in a light batter.

• **Chef Eduardo's**, 1640 N. Wells, 266-2021. All cooking done to order from an interesting, limited menu: tortellini alla panna and veal cutlets Valdostana (with prosciutto and fontina) are specialities. All a la carte, entrees average $11.50.

• **Danilo's**, 2435 S. Western, 847-6375. Homemade tortellini in ragu Bolognese (tomato-meat sauce) and good quality veal on a limited menu in Heart of Chicago. Low prices, friendly service.

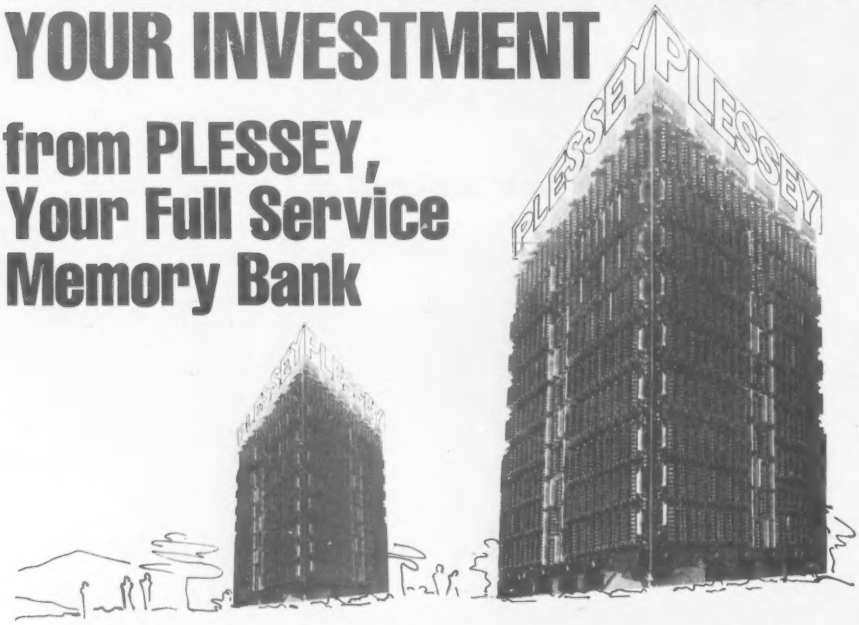
• **Doro's**, 871 N. Rush, 266-1414. Chicago's most elegant and expensive Italian restaurant, with superb northern Italian cooking and a large, varied menu.

• **Florence**, 1030 W. Taylor, 829-1857. A tiny, informal, friendly spot near the University of Illinois' Circle Campus, about 10 minutes from McCormick Place. Limited, interesting menu includes pasta with vegetable sauces and a torta rustica (ricotta and spinach pie); Il Diplomatico (homemade rum-chocolate cake) for dessert. Always a special entree at lunch and at dinner. Low prices; 8:30 closing in the evening.

• **Salvatore's**, 525 W. Arlington, 528-1200. This spacious room with high ceiling and dim lights provides a trendy setting for an interesting northern Italian menu. Cooking is uneven but largely good.

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WELCOME TO THE NCC

The 1981 NCC. You've been waiting for months. First, you waited with your travel agent to see if those confirmed airline and hotel reservations would come through at the last minute. Then you waited in those long lines at the registration desks, hoping to get into the show before it closed. Once inside, you waited patiently to talk with salesmen who hopefully would have a solution to what you just knew was a simple computer problem. In despair, you began to wonder . . . Is there really anyone or anything at the NCC that can help me? Then, just as you were about to leave, you turned the corner and . . . there it was! The real reason you came to the NCC . . . Intertec Data Systems! The company you've been hearing a lot about lately. And the people you've wanted to talk with about your special computer needs.

And there's plenty to talk about this year. So much, in fact, that a special twenty minute audio visual presentation entitled "Tomorrow's Technology Today" will be featured in the theatre section of Intertec's spectacular two-story booth. It's a brief history of Intertec's record breaking growth and a capsule review of the products and services that have thrust the company into the forefront of microcomputer technology.

The show is presented continuously on the hour and half hour. Just walk in, take a load off your feet, and enjoy the program.

After the show, leisurely browse through Intertec's full line of video terminal and microcomputer systems . . . including the world renowned SuperBrain™. The desktop video computer that handles almost any data processing application with ease. It's a general purpose business system. It's an intelligent terminal. Or, it's a remote job entry station. It's so flexible and low in cost, it can tackle even your toughest programming problems.

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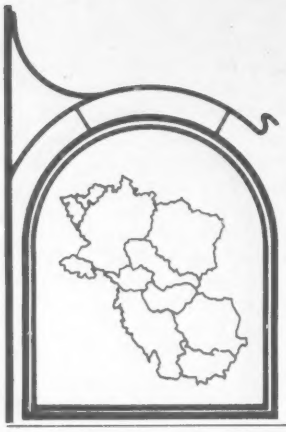
Whatever you see or do at this year's NCC, don't miss out on all the excitement at the Intertec exhibit. Drop by the information desk and leave your name and address. Or, have an Intertec sales agent show you the industry's newest and most exciting products. They're all on display at the company that means business when it comes to microcomputer technology.

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See us at Booth 847.

Central European



By Maggie Kast
Special to CW

We are listing here a wide variety of places serving Austrian, Hungarian, German and Polish food or cooking influenced by these traditions. Not all homey, ethnic spots, they include Kennessey's fascinating wine cellar and coffee house and Louis Szathmary's landmark restaurant, The Bakery. In addition, see **The Berghoff** listed under "Solid Quality, Top Value."

• **The Bakery**, 2218 N. Lincoln, 472-6942. Continental cooking with Hungarian influences on a prix fixe ($20) menu of five courses. You can choose from eight to 10 entrees; Szathmary is known for his individual Beef Wellingtons and pork stuffed with Hungarian sausage.

An additional complementary course, such as smoked trout, occasionally makes an appearance. Elegant atmosphere, but can be rushed when crowded and is usually clamorous.

• **Bratislava**, 2527 N. Clark, 348-6938. Stick to the Czech specialties such as roast duck, beef gulyas, Szegedy Gulyas (pork and sauerkraut), wiener schnitzel, veal or chicken paprikash. A family spot with low prices.

• **Kennessey's Wine Cellar Restaurant**, 403 W. Belmont, 929-7500. Unfortunately, this beautiful wine cellar recently added an "international" menu with entrees from 12 different countries, and a few of the efforts are real losers. But it's still a great place to drink a bottle of wine (choose one from the shelves and pay only $1 corkage fee over the retail price for still wine), and sample Ivan Kennessey's cream cheese spreads (all variants of the Hungarian Liptauer).

Langos — Hungarian deep-fried peasant bread with garlic — is authentic and unusual, and wiener schnitzel and Hungarian gulyas are safe bets among the entrees. Wonderful variety of homemade pastries and coffees for dessert.

• **Patria**, 3030 N. Central, 622-2300. Complete dinners under $5 at this home-style Polish restaurant, featuring pierogi, schnitzel and braised beef tongue. Imported Krakus beer from Poland is a good drink.

• **Salzburger Hof**, 4128 N. Lincoln, 528-6909. Cuckoo clocks on the walls, comfortable booths and motherly, dirndl-outfitted waitresses create an authentic, casual Austrian atmosphere. But beware the ridiculously eclectic menu; stick to liver-dumpling or farina-dumpling soup and one of the Austrian specialties. Wiener schnitzel, natur schnitzel (the same meat without breading) and Hungarian gulyas are all great.

Pizza And Ribs

This is a small sampling of the many good places to go for today's favorite casual food items, pizza and ribs.

• **Bacino's**, 2204 N. Lincoln, 472-7400. Simple pizzeria with the two-crusted, stuffed kind invented by Giordano's, as well as the thin-crusted kind. Stuffed pizza can make heavy going, but the one with spinach, mushrooms and cheese is an excellent version.

• **The Bulls**, 1916 N. Lincoln Park West, 337-3000. This bar with music has good food as well: thin-crusted pizza, half-pound hamburgers, tacos and enchiladas, spinach pie in filo pastry and a great multi-ingredient salad. $1.50 cover charge weekdays.

• **Carson's**, 612 N. Wells, 280-9200. This most famous place for ribs has been faulted for long waiting times and rushed service, but $9.95 brings you great ribs, salad and potatoes. Steak and seafood available, too.

• **Giordano's**, 747 N. Rush, 951-0747. The originator of the double-crusted stuffed pizza. The special is stuffed with sausage, onion, peppers, mushrooms, cheese, tomato sauce and garlic; you can't eat too much of this.

• **Pizzeria Uno**, 29 E. Ohio, 321-1000. Eating pizza is lots of fun in the crowded, sociable atmosphere of this traditional hang-out. Graffiti covers the walls, and the pizza is thick, crisp, generously filled and delicious. There's a nice bar if you have to wait.

• **Pizzeria Due**, 619 N. Wabash, 943-2400. The place to go if Pizzeria Uno is too crowded — the food is the same, the atmosphere a little more open.

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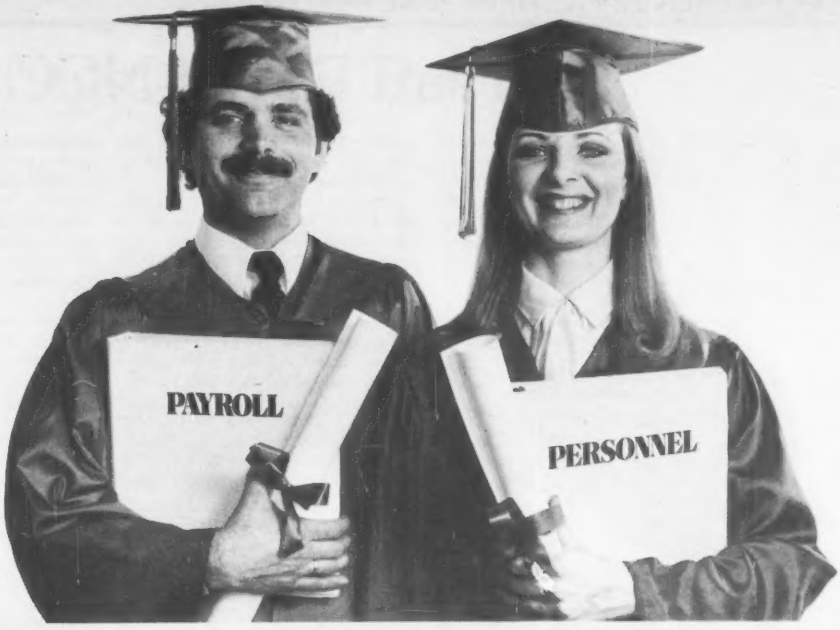
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A Hard Day at NCC Deserves

By Deborah Wise
CW Staff

CHICAGO — After the sessions are over and McCormick Place closes its doors every day, weary National Computer Conference attendees can either put their feet up in the seclusion of their hotel rooms or join the hustle and bustle that typifies Chicago's exciting nightlife.

Don't be boring. A day at NCC deserves a night on the town.

And just take a look at what this lakeside city has to offer.

Jazz, blues, country and western, rock, reggae, new wave and classical music can all be heard within a $5 cab ride from any downtown hotel. The theater district is alive with Broadway hits and excellent local productions that may soon make their way to Broadway. Soon, the memory of a day on your feet will begin to fade as you anticipate the night's adventures.

Chicago has ranked with New Orleans as a center for jazz and blues artists from these heydays of Louis Armstrong, Benny Goodman and Earl Hines. And the tradition continues. You can hear live jazz and blues in dozens of clubs just minutes from the downtown Loop area.

Rush Street, once famous as the center for the "Chicago sound" has lost some of its glamour, but the sound, of jazz continues to be heard in different clubs that have inherited the Chicago musical tradition.

Jazz at the Blackstone Hotel has the reputation for the best bookings in town, and live jazz can be heard here year-round. **Rick's Cafe American** also attracts the big names and is situated in the Holiday Inn Lake Shore within the downtown area. **Jazz Showcase** is another club that has good jazz nightly and a good reputation.

On Rush Street, the best of the intimate, smoky bars that still retains the atmosphere associated with wailing saxaphones and after-hours drinking is the **Backroom Club** .

But if you are looking for atmosphere and you've heard that the South Side is the place to go, we suggest that you don't search it out on foot if you don't know the neighborhood. It can be dangerous, and you can just as easily hear some great music and musicians within a safe distance from your hotel.

If you like neighborhood promenades and lively sidewalk society, Chicago's Near North Side is just the place for an evening stroll. You pass clubs, restaurants, bistros and folk clubs, avant garde theaters and ethnic nightclubs. The street to find is North Lincoln and the landmarks to watch for are the **2350 Restaurant and Pub**, which has the longest menu in town, and the **Orphans,** a club for blues, jazz and folk.

Today's Trend: Reggae

Jazz may be what Chicago was famous for in the past, but the "in" thing today is reggae. The trend hit just before Christmas and is still going strong. As the nightclub life has died, new music clubs have sprung up to fill the void.

Although the famous **Empire Room** with its fine dance orchestra still attracts many patrons who want to spend an evening listening and dancing to elegant music, the crowds are going to **Mothers, Tuts, Waves, Chicago** or a neighborhood bar like **Panorama** to hear the best of reggae, new wave and rock and to dance enthusiastically to the new beat.

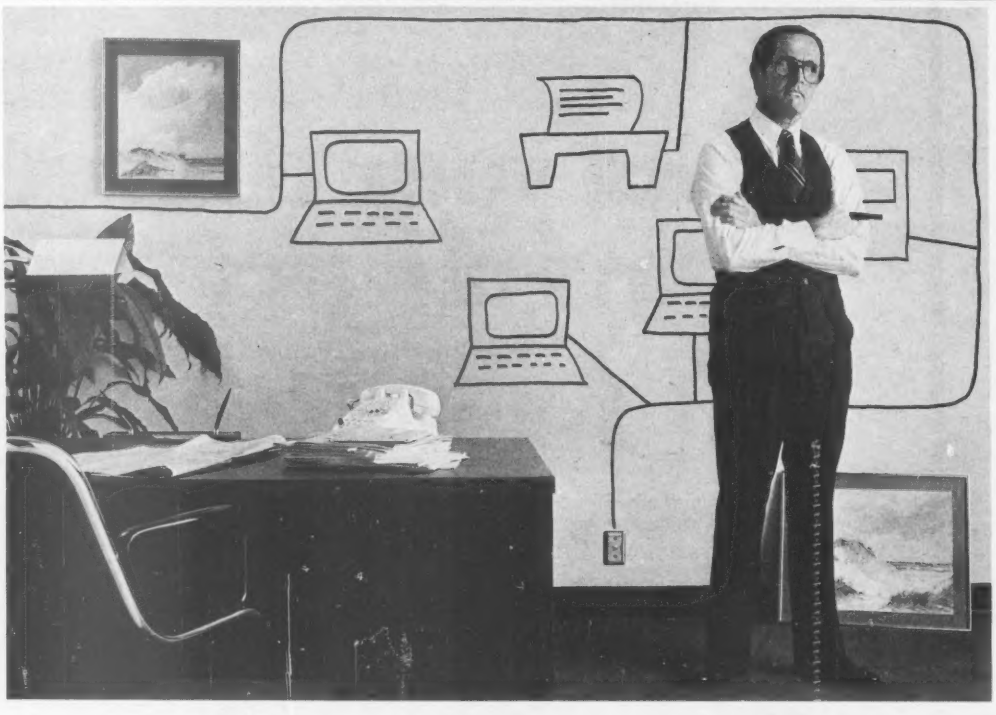
But if all this leaves you cold, is not your line and you're wondering what you're doing so far from Nashville, fear not. Chicago has a host of Opry alternatives that could have come straight from Tennessee.

For real country atmosphere, try the **RR Ranch**. The club has been open for 25 years and offers traditional country and bluegrass. Another bluegrass specialty spot is the **Clearwater Saloon,** or you could try **McGiddies.**

All in all, there's something for everyone here. Even classical music fans are in for a treat. The **Juilliard String Quartet** will be playing at Orchestra Hall on the evening of May 7, the day NCC ends.

But if music isn't your game, you can still get a barrel of laughs from a night on the town.

For starters, you could take in all



We were here three years ago.



A Good Night on the Town

the laughs and more at the famous **Second City** comedy revue. Excellent reports have circulated about this year's notorious show that goes under the name **Well, I'm Off to the Thirty Years' War or Swing Your Partner to the Right.** But you'd better book fast. The word is getting around.

Or, if you prefer improvisational comedy, Chicago can offer a variety of local talent at **Chicago Comedy Showcase,** where the lineup changes nightly.

And when the stand-up comics have been gagged at **Zanies,** they make room for a satire that chronicles the activities of Chicago's lady mayor: **Byrne, Baby, Byrne** is constantly updated and remains a favorite among Chicago weekend theatergoers.

Chicago also offers more conventional theater for those who love to see lavish, cast-of-thousands productions.

Top of the list for the first week in May must be Hal Prince's staging of the Andrew Lloyd Webber and Tim Rice musical **Evita** playing at the Shubert Theatre. This vibrant pageant, which tells the story of Argentina's rags-to-riches political personality Eva Peron, bursts with life and talent. The songs are memorable and the visual stage images stay with you as you leave the theater.

Evita has played to packed houses in London, New York, Los Angeles and here in Chicago, too. Valerie Perri, in the title role, has received rave reviews. The show is certainly worth a visit.

Another noted theatrical production in town now is **Album,** a comedy-drama that tells the story of four children growing up in the '60s. Jennifer Grey, daughter of film star Joel Grey who played opposite Liza Minelli in the film *Cabaret*, takes one of the leading roles. The show is at the Apollo Theatre.

Twigs, a situation comedy about a mother and her three children starring television personality Cloris Leachman, is playing here at Drury Lane Water Tower Theatre. This would be a comfortable evening out after a long day at the show.

For those more adventurous in their tastes, those who are looking for something a little different, **Goodtimes** is a dramatic interpretation of the trials of a Harlem family. Steve Carter of the Negro Ensemble Company of New York has staged this play at the Victory Gardens Theatre with Esther Rolle in the leading role.

Other shows in town include **Juno and the Paycock** at the Court Theatre and **One More Time** at the Blackstone Theatre.

What hasn't been mentioned yet? A host of listings to suit everyone. But if you're reading an extended list of places to go and people to hear and you're not sure what is the best thing to bet on, then we hope that the above selection will make it easier for you to choose. All are within easy distance from the downtown hotel areas and do not cost more than a few dollars cabfare.

It is not suggested that you walk or take the subway system at night here if you don't know the city. But that shouldn't restrict your nightlife. Chicago could so easily be your kind of town.

• Directory •

CLASSICAL MUSIC

The Orchestra Hall, 220 S. Michigan. 435-8111.

COMEDY SHOWS AND CLUBS

Chicago Comedy Showcase, 1101 W. Diversey Parkway. 348-1101.

Second City, 1616 N. Wells. 337-3992.

Zanies, 1548 N. Wells. 337-4027.

COUNTRY & WESTERN BLUEGRASS

Clearwater Saloon , 3447 N. Lincoln. 935-6545.

McGiddies, 2423 N. Lincoln. 472-7037.

RR Ranch, 56 W. Randolph. 263-8207.

DANCING

Empire Room, Palmer House, State and Monroe Ave. 726-0330.

JAZZ CLUBS

Backroom Club, 1007 N. Rush St. 944-2132.

Jazz at the Blackstone Hotel, 636 S. Michigan Ave. 427-4300.

Jazz Showcase, 901 N. Rush St. 337-1000.

Orphans, 2462 N. Lincoln Ave. 929-2677.

Rick's Cafe American, Holiday Inn Lakeshore, E. Ontario St. at N. Lake Shore Drive. 943-9200.

NEW WAVE AND REGGAE

Chicago, 5246 N. Broadway. 878-0202.

Mothers, 26 W. Division St. 642-7251.

Panorama, 3801 N. Clark. 348-8948.

Tuts, 959 W. Belmont St. 477-3365.

Waves, 3730 N. Clark. 935-2299.

THEATRE

Album, Apollo Theatre, 2540 N. Lincoln. 935-6100.

Evita, Shubert Theatre, 22 W. Monroe. 977-1705.

Goodtimes, Victory Garden Theatre, 3730 N. Clark. 549-5788.

Juno and the Paycock, Court Theatre, 5706 S. University. 753-3581.

One More Time, Blackstone Theatre, 60 E. Balboa. 431-0660.

Twigs, Drury Lane Water Tower, 175 E. Chestnut. 266-0500.



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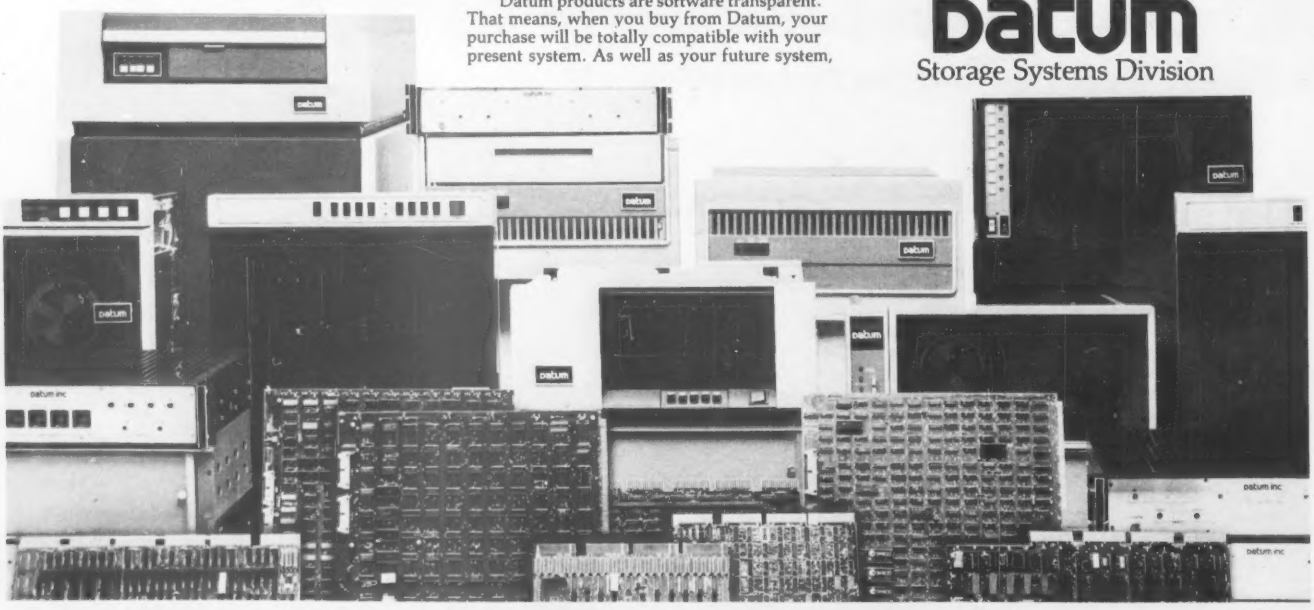
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Storage Systems Division



Software at NCC

Cullinane Database Systems, Inc.

CHICAGO — Cullinane Database Systems, Inc. will display a list of 17 of its software products, including its IDMS data base management system, EDP Auditor, On-Line English and On-Line Query and Shared Database System (SDS) at Booths 307, 308 and 309.

IDMS conforms to Codasyl specifications and is fully integrated with and driven by the company's Integrated Data Dictionary, which allows users to create and maintain a centralized resource for capture and control of data, the vendor said.

On-Line English enables users to view computer-stored information by means of simple requests, and On-Line Query is used to access information stored in an IDMS data base and to produce and format ad hoc reports, the company said.

Further information on these and other Cullinane products to be shown is available from Cullinane Database Systems, Inc., 400 Blue Hill Drive, Westwood, Mass. 02090.

SAS Institute, Inc.

CHICAGO — SAS Institute, Inc., at Booth 116, will introduce an econometrics and forecasting software package, as well as a series of video training courses.

The SAS/ETS forecasting software extends the modeling and simulation capabilities of SAS, the firm's premier package that handles data management, statistical analysis and other programming chores. The ETS product offers a range of facilities from automatic procedures to advanced statistical techniques, a spokesman said. Included in the package is a procedure for forecasting hundreds of variables and procedures for forecasting and analyzing time-series data.

The system's modeling procedures handle financial and econometric models and include capabilities for estimating parameters, generating predictions and performing policy simulations. A Computab procedure, included in the package, organizes data into tabular form and prints row-and-column reports.

In addition to SAS/ETS, the booth will showcase enhancements to SAS/Graph, a program for device-intelligent color graphics. The enhancement includes new routines for mapping, contour plotting, annotating output from other SAS procedures and reproducing displays previously created by other SAS/Graph procedures.

Both SAS/ETS and SAS/Graph are integrated into SAS for a total data management and reporting system, the spokesmam pointed out.

The SAS Institute may be reached through Box 8000, Cary, N.C. 27511.

Intel Corp.

CHICAGO — Intel Corp.'s Systems Group will introduce Genius, a report generator for its System 2000/80 data base management system (DBMS), and several other products at Booth 611.

Another product that will be on display is the Data Base Assist Processor, a new option which complements Intel's Fast-3805 semiconductor disk. Native Mode, another Fast-3805 feature which will be spotlighted at the National Computer Conference, reportedly improves CPU performance by reducing channel-driver overhead.

Intel will demonstrate Taps/80, an on-line application development aid operating under CICS which manages the application development and production process.

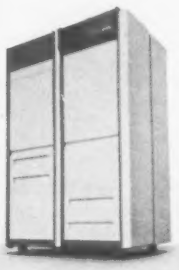
Query/Update by Example (Quex), Intel's menu-driven interactive end-user aid that is said to enable non-DP personnel to access DBMS capabilities, will also be demonstrated.

Genius, an adjustment to Intel's Report Writer feature, is priced at $10,000. Taps/80 costs $30,000 and Quex costs $15,000 for systems running under IBM's OS.

The Data Base Assist Processor is available for $8,500 for users who have System 2000/80 and the Fast-3805 feature. The Native Mode option may be leased for $350/mo, the vendor said from 12675 Research Blvd., P.O. Box 9968, Austin, Texas 78766.

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of 32-bit multiprocessor systems

See us at
NCC Booth 948



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Additionally, built-in growth potential allows you to respond to changing requirements easily and quickly — without modifying either the operating system or your applications software.

As for reliability and support, they're established family traditions, proven by over 2,500 other BTI computers operating in the U.S., Canada and Europe. For full details about the BTI 8000, contact the BTI office nearest you.

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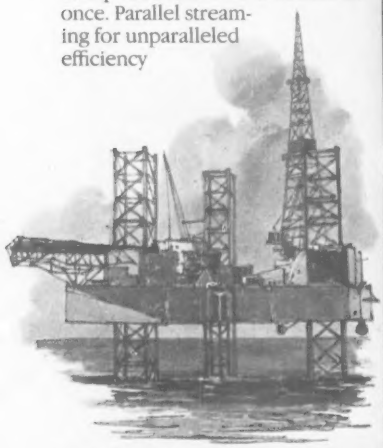
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and throughput. Multi-streaming is a natural extension of our multi-user, software-first design philosophy.

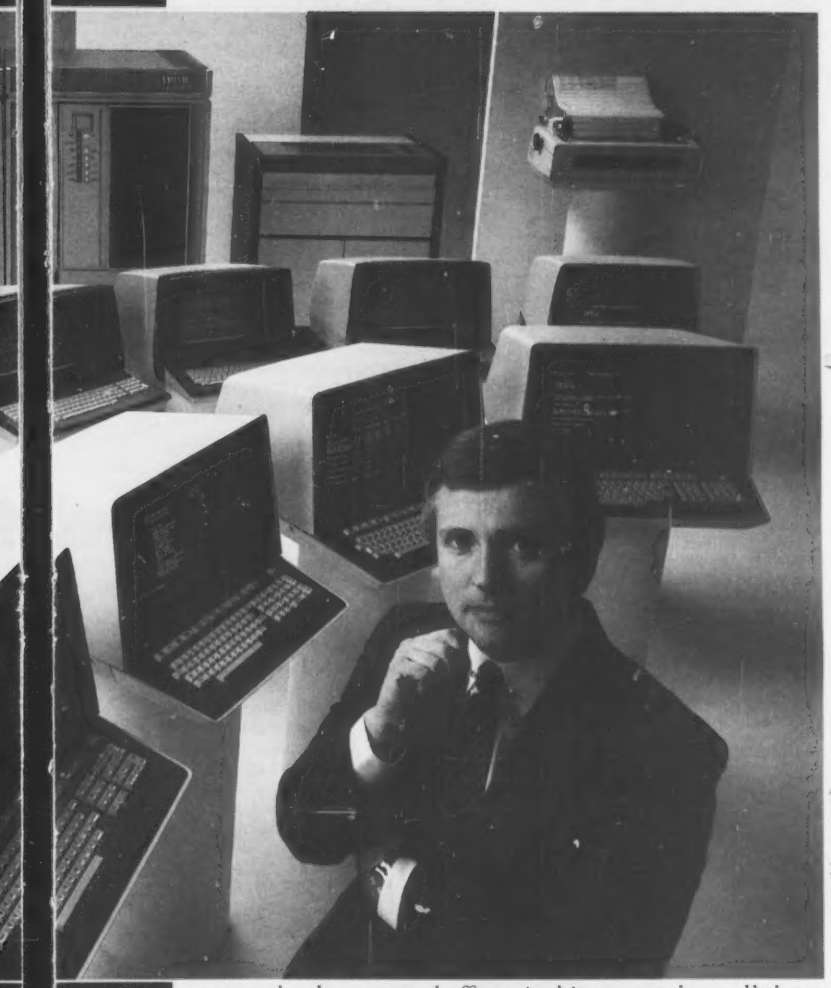
Ultra-high density memory. The Prime 850's advanced architecture uses the latest in technology, including ultra-high density MOS memory that stores 64K bits on a single chip, allowing one megabyte to be stored on a single memory board. It has high-performance features like Burst-Mode I/O and Instruction Preprocessing for rapid response to user demands. And it supports 128 interactive user terminals for exceptional cost-effectiveness.



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energy development and office automation. It saves time and money in all types of general business environments. It offers the perfect combination of hardware and software for technical engineering environments such as product analysis and design.

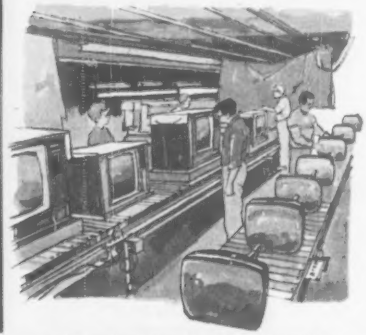


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PRIME
Computer

Software at NCC

British Information Services

CHICAGO — The British computer market will be represented at the National Computer Conference by several vendors:

The Aregon Group will demonstrate its International Viewdata System IVS in Booth 1612. It will be linked to the vendor's Anaheim, Calif., viewdata service bureau.

Delpha Systems Ltd. in Booth 1518 will exhibit its Data Transfer Telex System. The system is used for direct conversion of handwritten, typewritten or word processor copy into telex tape and reportedly eliminates one or both of the typewriting stages involved in the conventional preparation of telex messages.

Integrex, Ltd. will display a color matrix printer reportedly requiring no special absorbency paper, for text, graphs, histograms, color VDU dumps and the like in Booth 1520.

IPC Electrical Press Ltd. (Booth 1617) will be showing *Systems International*, a European monthly for systems designers and engineers.

Lynwood Scientific Developments Ltd.'s Alpha and Beta visual display terminals will be shown in Booth 1611.

Microfocus Ltd. will be discussing its CICS Cobol software products, which reportedly permit the development and execution of application programs written in Cobol on microcomputers (Booth 1615).

Micropad Ltd.'s Micropad, a peripheral device which reportedly captures handwritten data at the time of writing for direct input to a computer system, will be on display in Booth 1512.

Modular Technology (Booth 1517) will show its data communications equipment.

Pericom (Booth 1614) will exhibit its multicompatible VDU, usable for DP and as a videotex terminal.

Plessey Microsystems Ltd. will show the Miproc 16 high-speed computer, the PBS 90M mass bubble memory for severe environments, and other bubble memory systems in Booth 1618.

Quest Automation Research Ltd. (Booth 1514) will show electronic equipment for the verification of signatures and the recognition of individual writing rhythms, with applications in the restriction of access to computer data to authorized personnel only. Rair Ltd. will show its Black Box III range of microcomputers in Booth 1511.

Tubs (Time Utilizing Business Systems) Ltd. (Booth 1515) will discuss its Cupid software tool for file, data entry and report definitions, designed for inexperienced computer users with no programming expertise.

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FORTRAN PACK includes all of the normal features plus special subroutines to allow enhanced file access and manipulation, sorting, use of screen ASIST, and many others. Overlay capability allows development of many programs normally too large for a small computer.

BASIC PACK has both EBasic for fast Basic applications and BBasic for applications requiring capabilities not normally available to Basic users, such as indexed files, structured "if-then-else" statements, Trace debug feature, formatted input and output, and others.

COBOL PACK is an ANSI 1974 version with many level two features plus the same enhancements as the FORTRAN PACK.



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McCormack & Dodge Corp.

CHICAGO — For users of Prime Computer, Inc.'s 750 and Sperry Univac's 1100 computer systems, McCormack & Dodge Corp. will be introducing compatible versions of its G/L Plus General Ledger/Financial Analysis System software in Booths 582 and 583.

Previously available for the IBM 360, 370, 30 series and 4300 (OS or DOS) and System/34, Burroughs Corp. medium- and large-scale machines, and the Honeywell, Inc. Levels 62, 64, 66 and Hewlett-Packard Co.'s HP 3000, the new packages are said to offer the same functional features and flexibility.

McCormack & Dodge is located at 560 Hillside Ave., Needham Heights, Mass. 02194.

Canon U.S.A.

CHICAGO — A general accounting software package for small businesses will be demonstrated by Canon U.S.A., Inc. at Booth 4516.

Written in Cobol, the package contains seven applications: order entry, accounts receivable, accounts payable, payroll, job costs, general ledger and inventory.

The package costs less than $15,000 and runs with two recently introduced Canon small business systems: the BX-3 and CX-1.

Canon can be reached at Suite 1306, 211 E. 43rd St., New York, N.Y. 10017.

Software at NCC

Cincom Systems, Inc.

CHICAGO — Cincom Systems, Inc. will highlight its Series 80 Mantis application development system at Booth 5724.

Introduced in January, the system provides beginning-to-end on-line application development without the need for batch processing, Cincom said.

It allows a programmer to create screens and files, write programs, test and debug applications, document systems, put systems on security menus and release applications for production — all interactively, the vendor said.

Major Features

Series 80 Mantis' major features include free-form interactive screen design, conversational file design and allocation, logical data views, on-line documentation system and conversational programming with a high-level language incorporating the strengths of Basic, PL/I, Pascal and APL.

Series 80 Mantis provides DOS/VS compatibility and is available for both CICS and Cincom's Series 80 Environ/1 on-line control monitor. Systems developed under one will run under the other without alteration, the company claimed, adding that Mantis also operates with Vsam.

In addition to Mantis, Cincom will exhibit its complete line of data base, data communications and application software, the vendor said from 2300 Montana Ave., Cincinnati, Ohio 45211.

Management Science America, Inc.

CHICAGO — Management Science America, Inc. (MSA) will display its line of software packages at Booths 231 and 232.

MSA develops, markets and supports an integrated line of standard computer application software packages including General Ledger, Financial Information and Control, Fixed Assets, Financial Forecasting and Modeling, Payroll, Personnel Management and Reporting, Accounts Receivable, Accounts Payable, Supplies Inventory Control and Purchasing and Procurement Matching Systems.

MSA has licensed more than 6,500 software packages.

The vendor is located at Suite 1300, 3445 Peachtree Road N.E., Atlanta, Ga. 30326.

Pansophic Systems, Inc.

CHICAGO — Pansophic Systems, Inc. will be discussing Panrisk, a risk analysis system for management planning, in Booths 5319 and 5320.

The system reportedly aids analysts by making it feasible to generate a full-scale estimate of expected loss without doing manual calculations.

This can be accomplished in even the most complex environments by using specific input data, the vendor claimed, and, as a result, the analyst can use the system to develop a quantitative evaluation of the cost benefit of proposed or existing protective measures.

The product costs $15,000, the vendor said from 709 Enterprise Drive, Oak Brook, Ill. 60521.

Digital Research

CHICAGO — Digital Research, the West Coast software vendor that developed the CP/M microprocessor operating system, will be at Booth 1746.

The firm will introduce the Independent Software Vendor (ISV) support plan, a service intended to help new software vendors create, develop and sustain their ventures. The service is oriented toward the microcomputer industry.

Digital plans to offer ISV seminars, technical support, licensing and software protection information, newsletters, manuals, magazine articles and an ISV Referral Catalog for Digital Research customers interested in CP/M-compatible products.

The Second ISV Seminar will be offered May 13-15 in Monterey, Calif.

Digital Research is at 801 Lighthouse Ave., Pacific Grove, Calif. 93950.

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IPL's 4446 is faster than IBM's newly-announced 4341-2 for most applications, costs less, and is field-upgradeable from the IPL 4443. First customer shipments of the IPL 4446 will be made in the third quarter of 1981.

To find out more about the new IPL 4400 family, call your local IPL representative. Or call or write: Vice President, Sales, IPL Systems, Inc. 360 Second Avenue, Waltham, Massachusetts 02154. (617) 890-6620.

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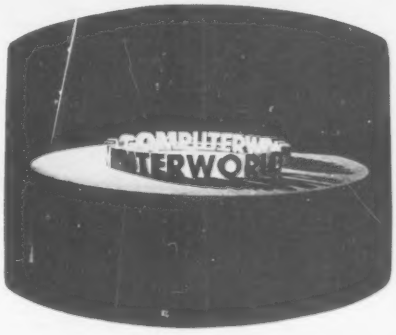
Computerworld on television takes a fascinating look at the impact of computers on our society. In a weekly, half-hour newsmagazine, you will see, hear and experience the effect of computers on medicine, sports, law, business, crime, personal privacy, personal growth, home life and much more. You will find out about failures as well as successes, progress and problems. You will hear and see the people who are involved, including:

- **Deaf children whose education has been revolutionized by the computer.**
- **Professional scouts who have used the computer to change the face of pro football.**
- **FAA Controllers who use computers to land your plane. Is the system adequate?**
- **Lawyers who are using computers to analyze supreme court decisions.**
- **Privacy experts who are trying to prevent computers from creating a "big brother" society.**
- **The psychologist who uses computers to study criminal behavior.**
- **DP experts in banks whose techniques are doing to paper money what money did to the barter economy.**
- **Computer people in business who have used computers creatively to improve their businesses — or to create whole new ones.**
- **Weather experts who use computers vs. the Old Farmer's Almanac.**

Introducing "Computerworld"—the first televised newsmagazine devoted to the development and application of the technology that is revolutionizing the way we function.







Computerworld for television will also step back a bit to provide some perspective on the continuing rapid technological changes in computers. Where is technology today? Where might it be tomorrow? What significant new products are becoming available? How is the industry changing and what is the impact of that change?

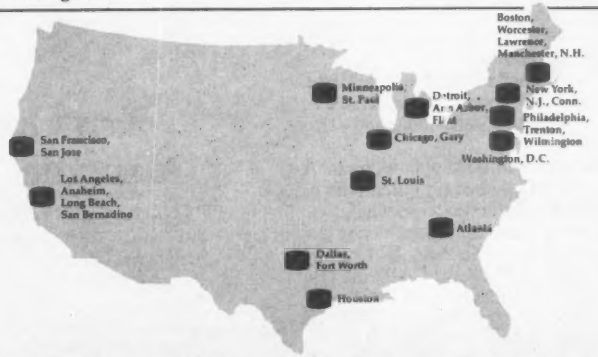
And, we aren't forgetting the lighter side. We'll cover a computerized adult game that helps you improve your sex life. Or the latest in non-sexual computerized entertainment. We have commentary on some of the pitfalls and problems on dealing with computers—both as expert and customer.

There's much more to Computerworld for television, but we can't go into it all. We invite you to find out for yourself. Both experts and interested laymen will enjoy and benefit from this unique new television experience. We're starting with coverage of 13 major tv "ADI'S" (Areas of Dominant Influence), which include about half the computer people in the U.S. Later we will add more markets.

Here is the current schedule of stations and times:

City	Station	Channel #	Day	Time
New York	WPIX	11	Saturday	9:00 AM
Chicago	WSNS	44	Tuesday	6:30 PM
Los Angeles	KWHY	22	Saturday	12:00 Noon
San Francisco	KTSF	26	Saturday	9:30 AM
Boston	WXNE	25	Wednesday	10:30 PM
Washington, DC	WDCA	20	Saturday	12:00 Mid.
Philadelphia	WTAF	29	**	10:30 PM
Dallas/Ft. Worth	KNBN	33	Tuesday	5:30 PM
Detroit	WXON	20	Saturday	10:00 AM
Minneapolis/St. Paul	KMSP	9	Saturday	TBA*
Houston	KHTV	39	Monday	12:00 Mid.
St. Louis	KDNL	30	Sunday	5:30 PM
Atlanta	WANX	46	Tuesday	11:00 PM

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*Check local listings for time.



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Software at NCC

Dataware, Inc.

CHICAGO — Dataware, Inc.'s Cobol syntax converter for Honeywell, Inc. H6000 users converting to IBM hardware will debut at Booths 1080 and 1081.

Dubbed Hotime, the package was reportedly designed to eliminate manual difficulties associated with Cobol conversions.

"In addition to hardware and other physical changes [when converting], users must consider the impact of changes arising because of software and system architecture differences," according to Chet Czekaj, Dataware president. "This tool was designed to make the transition less painful."

Hotime runs on IBM 360, 370 or compatible systems in DOS or OS environments via user-adjustable parameters. The annual license fee is $4,800.

In line with what the firm sees as a "growing demand for Vsam support," it will also introduce an enhanced version of its RPG-to-Cobol (RTC) package for users with Vsam files.

Designed to assist in converting RPG or RPG-II to Cobol during migrations involving IBM's System/3, 360/20, DOS and OS operating systems and Univac systems, the package allows RPG-II programs to access Vsam file structures directly, a spokesman noted.

Dataware also offers an RPG/RPG-II-to-PL/I translator, and both packages are available in DOS and OS Cobol versions to run on any IBM 360, 370 or compatible computer.

With an annual license fee of $18,300 including a one-week installation and training session, the software is available from Dataware at 2565 Elmwood Ave., Buffalo, N.Y. 14217.

Structured Methods, Inc.

CHICAGO — A subscription service/methodology package called Metasystem 1000 developed by Structured Methods, Inc. will be shown at Booth 1717.

Package subscribers will receive original articles about software development and reprints of essays as well as reviews of articles and books relating to the software life cycle, the vendor said.

Metasystem 1000 subscriptions are available for $1,000 from Structured Methods, Inc., 7 W. 18 St., New York, N.Y. 10011.

Micro Data Base Systems, Inc.

CHICAGO — Micro Data Base Systems, Inc. will show its extended Hierarchical Data Base System (HDBS) at Booth 4020.

HDBS reportedly runs on most Z80-, 8080-, 8086- and 6502-based microcomputers. Features include a hierarchical data structure, read/write protection and the ability to handle fixed-length records. The price for the HDBS is $300, the vendor said.

The firm will also be showing its MDBS, a full network-oriented data base management system for minicomputers.

Features include network data structures, the ability to use fixed- or variable-length records, multiple levels of read/write protection and recursive ownership. MDBS is priced at $900.

The vendor may be reached through P.O. Box 248, LaFayette, Ind. 47902.

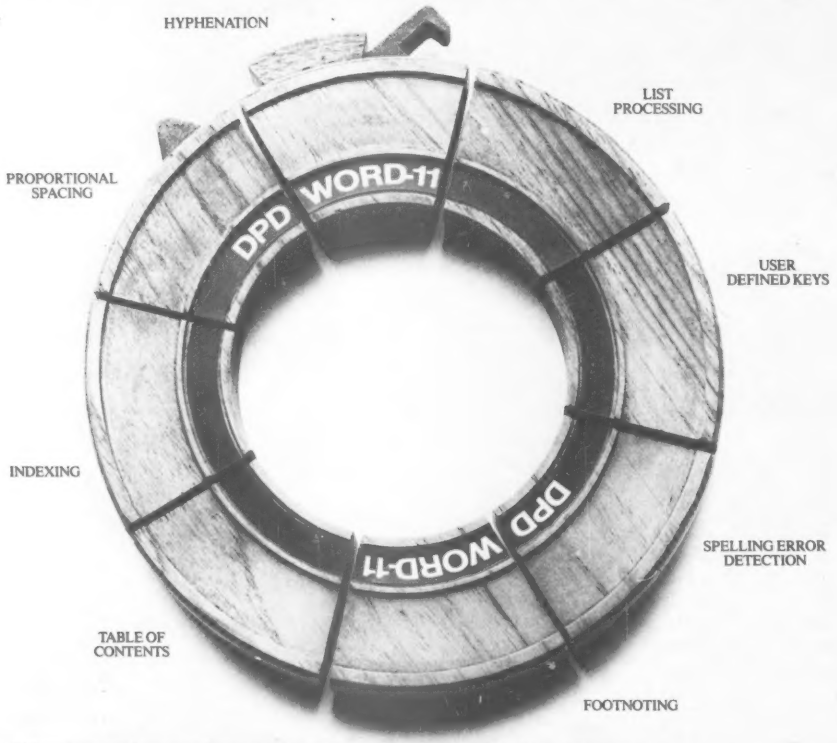
Ken Orr & Associates, Inc.

CHICAGO — Ken Orr & Associates, Inc. will be demonstrating its Data Structured System Development methodology at Booth 5131.

The method is reportedly a dynamic approach to software development that covers planning, requirements definition, system and data base design, programming and project management.

The vendor is based at 715 E. 8, Topeka, Kan. 66607.

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Data Processing Design, Inc.

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Software at NCC



IMSL, Inc.

CHICAGO — IMSL, Inc. will display information on its mathematical and statistical Fortran software packages for the scientific and engineering communities in Booth 526.

The IMSL Library includes 495 subroutines, grouped into 17 chapters, covering a wide range of topics in mathematics and statistics, according to the firm.

Also explained will be the firm's latest software package, Twodepep, Edition 2, a small finite element program that solves a variety of two-dimensional partial differential equations. Twodepep (*Two* Dimensional *E*lliptic, *P*arabolic and *E*igenvalue *P*roblems) reportedly solves up to 10 simultaneous equations, allows a variable time step and permits direct handling of time-dependent Dirichlet boundary equations. It also employs a special bandwidth reduction algorithm said to improve on the Cuthill-McKee bandwidth.

It also features Twoplot, a graphical output package that plots scalar, vector and stress fields, a spokesman said from the NBC Bldg., Sixth Floor, 7500 Bellaire Blvd., Houston, Texas 77036.

Interproject, Inc.

CHICAGO — In Booth 1708, Interproject, Inc., a computer software firm, will introduce both a comprehensive data base management system and a cluster network operating system for Digital Equipment Corp. LSI-11 and PDP-11 computers.

The Rtfile DBMS incorporates file creation, screen formatting and report generation capabilities. Other features include sorting, logical operators for record selection, print spooling and full arithmetic functions, a spokesman stated.

In its user mode, all of the package's functions are avilable without programming. In the alternate programming mode, Rtfile subroutines are said to improve programming efficiency by up to 70% over conventional programming techniques.

The DBMS package is available in both single- and multiple-user versions, the spokesman noted.

Star-Eleven is a cluster/network operating system that allows up to 14 satellite processors to share the facilities of a host processor. System features allow parallel processor applications, interprocessor communications, fast interrupt response and larger program address spaces, the spokesman claimed.

Interproject may be reached through P.O. Box 13, Brentwood, Md. 20722.

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Greg O'Reilly, Systems Manager, Figi's, Minneapolis, MN "We have gotten many applications going because UFO is so easy to use... jobs such as on-line credit card verification, file maintenance utilities created without CICS mapping, and many small requests by user departments. Most of our people aren't CICS trained."

Steve Harris, Director of MIS, Children's Hospital, Boston, MA "The first thing I did when I joined the hospital was buy UFO because I used it for more than a year at my last job; we are simply more productive in our on-line development with UFO. Many projects which were too expensive with traditional CICS technology become cost-effective when you use UFO.

"UFO trades off machine power for people power. While it takes a reasonable amount of training to teach someone UFO, you certainly don't have to be a CICS programmer to use it."

Ken Cyrus, Database Manager, Carter Machinery, Salem, VA "We were looking to get on-line transactions up faster than under standard COBOL. We had DMS installed for two weeks, but got absolutely nothing done. Within the first two weeks with UFO, we had at least 20 to 30 VSAM update/inquiry programs up.

The most surprising thing about UFO was its execution speed. I never figured anything interpretive could execute as fast as it does."

Frank Scafidi, Director of Technical Services, University of Pennsylvania, Philadelphia, PA "Two years ago we had 10 applications up under CICS. Today, we have over 50 applications up under UFO. We never could have done so much without UFO."

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Software at NCC

International Computer Programs, Inc.

CHICAGO — At Booth 4902, International Computer Programs, Inc. (ICP) will distribute brochures highlighting the 15th anniversary special edition of *Interface*, its publication which addresses industry or functional segments of the software product and service user community.

The anniversary issue will be distributed to over 63,000 users of software products and services in the fall of 1981, with an additional 15,000 prepared for circulation at trade shows, ICP said.

Editorial Content

Editorial content will feature the "ICP 100 Report," including the "Top 15" software vendors and service bureaus by specific industry; "Fifteen Guidelines to Software and Services Buying"; and "Fifteen Software and Service Companies to Watch in the Next Five Years."

ICP also produces the *ICP Directory*, a reference guide to software product, service and supplier offerings which provides software product and service solutions, the firm said.

ICP also produces a supplier's volume which describes vendors' capabilities and includes corporate descriptions.

ICP is headquartered at 9000 Keystone Crossing, Indianapolis, Ind. 46240.

American Intelligent Machines

CHICAGO — American Intelligent Machines (AIM) will be demonstrating its software packages at Booth 5405.

Among the products to be exhibited are:

• Amcap Level 1.6, a computer business and accounting system for serial microcomputers offering "hidden detail" for chart of accounts and an updated posting program; and Vamcap Level 1.6, a version for video machines.

License fee for both is $975.

• Amcap package for upgrading from Level 1.5 or 1.6 to Level 2.1 priced $995.

• Amcap Level 2.1 system incorporating all of the features of Level 1.6 plus capabilities that include balance forwarding, updated posting and programming for W-2 forms, 941 forms check register and payroll check forms.

The license fee for the product is $1,970.

• Amcap package for upgrading from Level 2.0 or 2.1 to Level 2A costing $800 with 2A featuring two-step invoice, back order, customer files, payroll employee address files and vendor files.

• Amcap upgrade software from 2A to 2A+ offering all Level 2A features plus point-of-sale capability priced at $800.

• Amcap RPG-II that allows the nucleus and sort to have access to all Amcap transactions.

License fee for Amcap RPG-II is $800.

• The American Mailer package that is a letter writer and mailing list maintenance program for CD-74, CD-23 and CD-7 hard disk systems.

The package costs $1,200.

• A hard disk manager package for CD-74, CD-23, CD-7, C2D and C3D systems.

The hard disk manager costs $675.

• T-Mum, a time-sharing multiuser manager for CD-75 and CD-23 disks. Fee is $1,770.

AIM is at 175 Half Day Road, Prairie View, Ill. 60069.

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Manufacturer	Item	Description
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Communications at NCC

Network Systems Corp.

CHICAGO — Hyperchannel adapters from Network Systems Corp. (NSC) will be on exhibit at Booths 404, 405 and 406.

Designed to provide high-speed and cost-effective interconnection of mainframes, minis and peripheral controllers within local and geographic networks, the adapters interface other hardware to coaxial cable data trunks, a spokesman explained.

Characteristics of each adapter include up to four data trunk interfaces per adapter, serial/parallel data conversion, message stacking and up to 8K bytes of buffer memory. A 16-bit microprocessor; data, address and status registers; selectable interface operations; and serial data transmission rates of 50M bit/sec are also featured, NSC said.

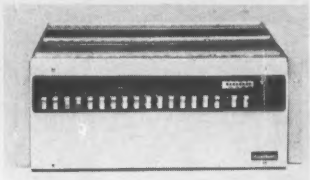
The firm also provides a variety of software products to facilitate Hyperchannel adapter implementation in processor-to-processor and processor-to-peripheral applications for manufacturers such as IBM, Control Data Corp., Digital Equipment Corp. and Sperry Univac.

Typical features of all adapter models include data rate buffering, hierarchical storage management, channel extension and access by many processors to a device or devices in a mixed-vendor environment.

With 60-day availability, the average Hyperchannel adapter costs $40,000 from NSC at 7600 Boone Ave. N., Brooklyn Park, Minn. 55430.

Racal-Vadic

CHICAGO — A direct-connect, originate/answer triple modem with multiline automatic dialing capability from Racal-Vadic will be on view at Booths 426-429.



VA3480 Modem

The VA 3480 modem series can automatically originate calls to and answer calls from three types of remote modems: Racal-Vadic's VA3400 series, Bell's 212A and the Bell 103/113 series.

The VA 3480 is compatible with Racal-Vadic's VA811 series of multiline automatic dialing units, making it possible for a single RS-366 computer port, or with a VA831 adapter, an RS-232C port, to control dialing for up to 28 VA3480s, the vendor claimed.

The VA3480 triple modem replaces eight different Bell-type modems and can also communicate with all versions of Racal-Vadic's VA3400 series of 1,200 bit/sec full-duplex modems, the company said.

The VA3480 can be ordered as a triple modem containing VA3400, 212A and 103 circuitry or as a dual modem with VA3400/212A or VA3400/103. Unit prices start at $950, the vendor said from 222 Caspian Drive, Sunnyvale, Calif. 94086.

Digitech Data Industries, Inc.

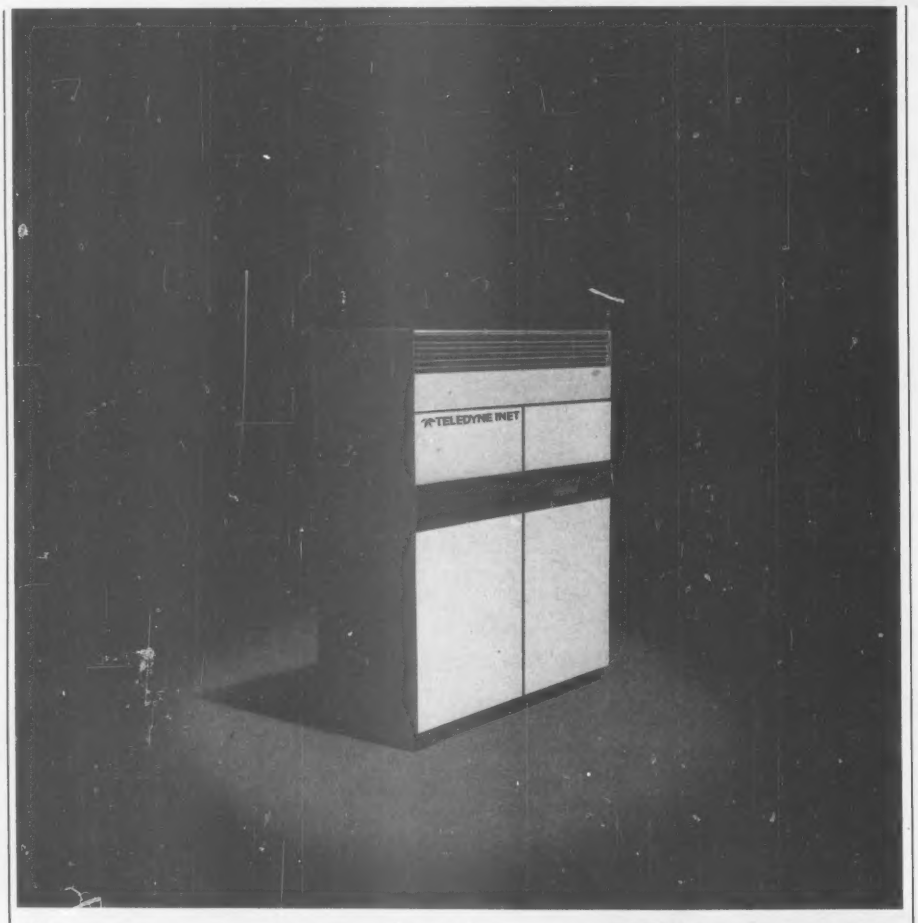
CHICAGO — Digitech Data Industries, Inc. will exhibit and demonstrate a line of data communications test equipment in a simulated live environment in Booths 4111 and 4112.

Featured will be the Encore 100, a diagnostic data system that acts as an intelligent monitor and interactive simulator.

It offers three operating levels of programmability, enhanced data displays, mass recording capabilities and high-speed orientation, the vendor claimed.

Digitech will also demonstrate the Data Monitor 200, a portable data line monitor. The product is available with tape and bit-oriented option and features tape compatibility with the Encore, a company spokesman noted.

Digitech is located at 66 Grove St., Ridgefield, Conn. 06877.



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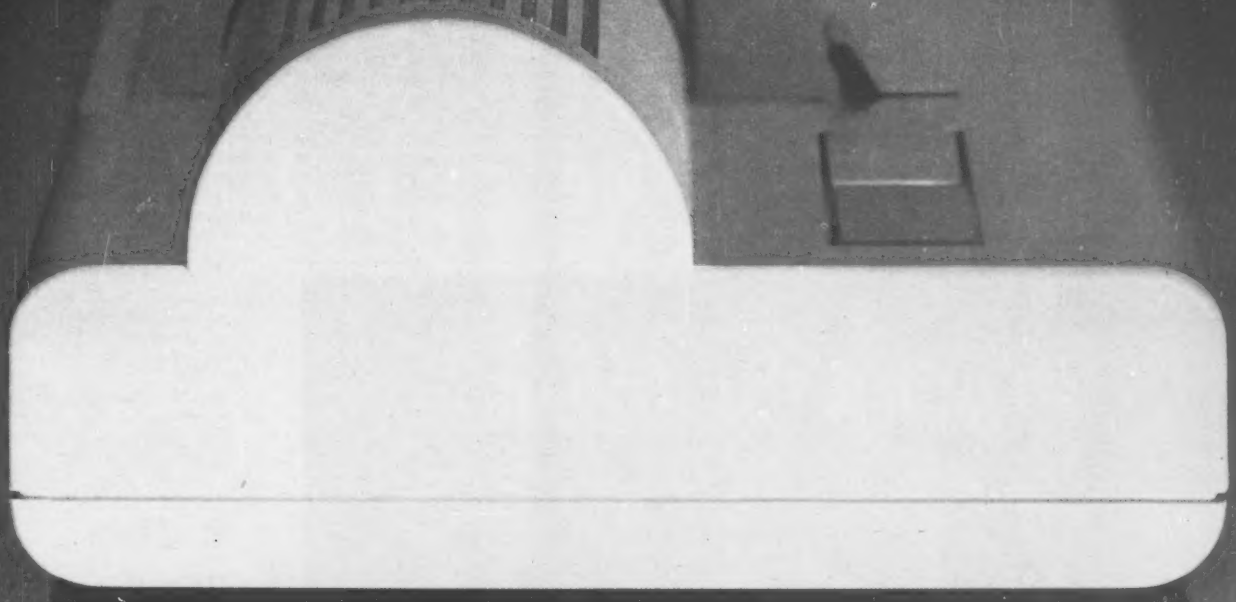
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Communications at NCC

Universal Data Systems

CHICAGO — Universal Data Systems (UDS) will introduce three new modems, an automatic dialer and a new data line monitor system at Booths 5301-5304.

Two of the new modems are additions to the company's telephone-line-powered LP product family. The 103J LP is an automatic answering, full-duplex 300 bit/sec modem that providess the user with switch selection for originate or answer frequency pairs. The single-quantity price is $245.

The 202S LP is an automatic answering modem that provides 1,200 bit/sec communications in half-duplex mode over public switched telephone networks. This unit is priced at $295. Both LP modems are direct-connect units.

Direct-Connect Unit

The third modem, the 208A/B, is a direct-connect unit combining two 4,800 bit/sec synchronous units in a single cabinet. Used with public switched telephone networks, the unit is half-duplex, but when used in conjunction with a four-wire private-line network it provides full-duplex operation, the vendor said. Single units cost $2,450.

The automatic dialer unit, the 801D/C, accepts command data at any speed from 75- to 9,600 bit/sec in either serial or parallel command formats.

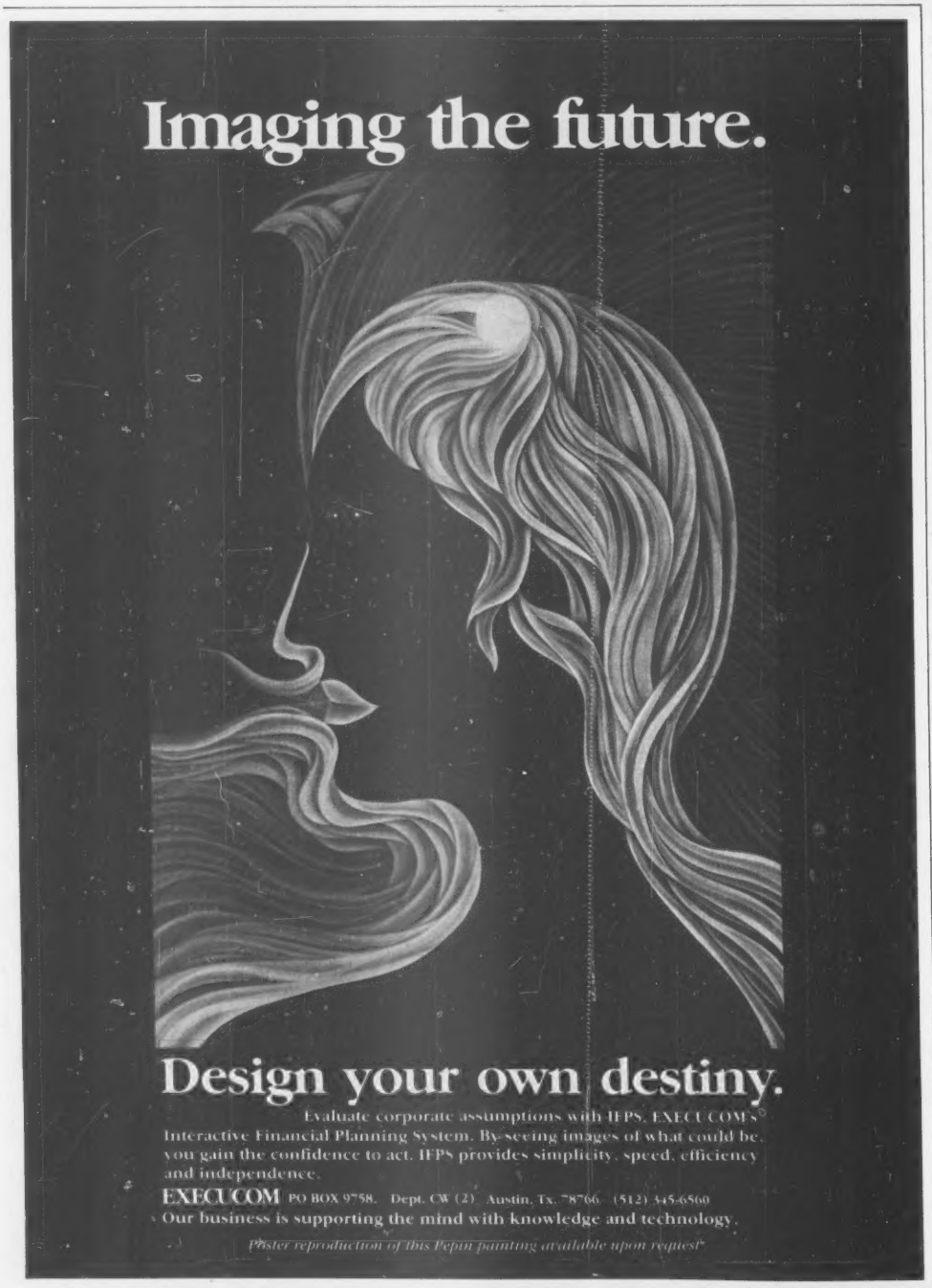
Although reportedly offering a great deal of flexibility, the interface format and the dial output must be specified at the time of order because the options are accommodated by plug-in circuit boards. This unit is priced at $750.

The Comtest 200 is UDS' data line monitor system featuring a full command input keyboard, a CRT screen and a combination of switches and patch panels to set up any network configuration in common use in North America.

Built-in test signal formats allow a user to evaluate the performance of each element in a data communications network and isolates a network malfunction to the specific modem, terminal or telephone circuit causing the problem.

The basic Comtest unit sells for less than $10,000 and a complete system including minidisk storage drives is priced at less than $11,000.

The vendor is loacted at 5000 Bradford Drive, Huntsville, Ala. 35805.



Data Communications Corp.

CHICAGO — Data Communications Corp. (DCC) will describe its Cylix communications network and its Unique family of distributed DP systems in Booths 5233 and 5234.

Cylix was designed to handle transaction-driven applications, such as data collection, order entry or inventory control. Last year, DCC began constructing satellite transmission facilities to increase the capacity and reliability of the Cylix network.

The network currently supports Burroughs Corp.'s Poll Select communications protocol. Software permitting IBM 3270s, 3270-compatible and X.25-compatible devices to communicate via Cylix will be introduced later this year, the vendor said.

DCC recently added Burroughs and Univac protocol emulators and shared-logic word processing enhancements to its Unique family.

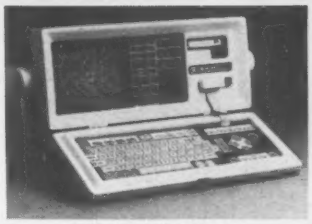
Based on Data General Corp. computers and DCC software, Unique systems feature concurrent multiuser operations in a distributed processing or mini-host environment. They reportedly handle data collection, transaction processing, data base inquiry and 3270 communications with locally stored format capability and word processing.

Unique systems are priced from $50,000. They are configured through DCC's Minicomputer Division and installed and maintained by DG. All Unique users have access to the Cylix communications network, which is priced according to the volume of information transmitted and variable flow rate characters, DCC said.

DCC is located at 3000 Directors Row, Memphis, Tenn. 38131.

Communications at NCC

Atlantic Research Corp.



The Interview 4500

CHICAGO — Atlantic Research Corp. will unveil an interactive test system for data communications protocol diagnostics at Booth 1650.

The Interview 4500 Interactive Test System is said to have many features specially designed for packet protocols and Systems Network Architecture, as well as detailed frame analysis of HDLC and IBM's SDLC. Bisync, async, Ascii, Ipars, EBCD, XS-3, Selectric and Ebcdic are standard in the unit, according to the firm.

The self-documented tape contains data and all the parameters used in the test. By inserting a tape containing a previously recorded test, the operator "simply observes the results," a spokesman said.

Major applications of the unit include host, terminal and node emulation; network monitoring; recording; and 72K byte/sec recording. The unit can also make simultaneous searches for multiple sequences of 16 characters, features 4-bit masks per string for indexing into bit-oriented protocols and allows 16 user-defined transmit messages from its 1,024-char. transmit buffer.

The Interview 4500 costs $14,500, and a conversion kit to change an existing Interview 3500 to the interactive 4500 model costs $5,000. The firm is located at 5390 Cherokee Ave., Alexandria, Va. 22314.

Innovative Electronics, Inc.

CHICAGO — Innovative Electronics, Inc., at Booth 521, will be demonstrating its MC-80 communications processor, which is said to support a variety of communications protocols while providing off-line diagnostics.

The MC-80 features modular software, allowing the system to be readily configured, providing device independence and reportedly a lower cost on RJE and interactive stations. The system also provides end-to-end peripheral control and multidrop, polling from front ends for minicomputers, and communications between computers from different manufacturers, a spokesman said.

Communications protocols are reportedly available which permit attachment of foreign devices to IBM, Burroughs Corp., NCR Corp. , Honeywell, Inc. and Univac networks. Attachment may be via direct hookup or through dedicated multidrop modems, the spokesman added.

Off-Line Diagnostics

Off-line diagnostics are executed when the system is powered on, as well as when initiated by the operator. The CPU, random-access memory (RAM), read-only memory (ROM) and data paths are tested via these methods.

A third level of testing is provided through test connectors, which connect outputs to inputs, completely testing every interface signal, the spokesman claimed. These diagnostics enable the clerical operator to easily isolate failures to the communciations processor, modem or terminal device, allowing the system vendor to maintain the system through initial telephone assistance.

The cost of the basic unit, with up to 16K RAM, 16K ROM, three serial communications ports and one parallel printer port, is $1,595. An additional port, allowing two independent terminal devices to be supported, costs $500, the spokesman said from the company at 15200 N.W. 60th Ave., Miami Lakes, Fla. 33014.

Lexicon, Inc.

CHICAGO — Lexicon, Inc. will show its Lexiscope 4000 CRT terminal controller at Booth 4229.

The unit features both graphics and alphanumeric display capabilities for use with Data General Corp.'s Nova and Eclipse processors.

The unit costs $2,200, the firm said from 60 Turner St., Waltham, Mass. 02154.

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Communications at NCC

Halcyon

CHICAGO — Halcyon, Inc. will show its 801 Mini Fox Data Monitor, said to detect line configuration even when DCE and DTE speeds are different, at Booths 1423 and 1 24.

The monitor features on-line, full-duplex data monitoring from 50- to 19.2K bit/sec.

The Mini Fox is priced at $3,495 from Halcyon, 1 Halcyon Plaza, 2121 Zanker Road, San Jose, Calif 95131.

Digital Communications Associates, Inc.

CHICAGO — Digital Communications Associates, Inc. (DCA) will be displaying its product line in Booths 5507 and 5508.

In keeping with its corporate philosophy, "Engineered to Expand," DCA said, it has offered in its System 355 Master Network Processor an array of network control and management tools.

The network manager can reportedly change destinations, sources, bit/sec rates and a variety of other port configurations from his console while the system is on-line. The log port provides a hard copy of summaries on port activity for future planning and evidence for telephone performance. This system is base-priced at $7,750.

Also on exhibit will be DCA's new support of the X.25 communications protocol for the System 355, a facility that implements the Consultative Committee of International Telephone and Telegraph's full X.25 standard.

It also includes a full-function Packet A/D (PAD) as specified by the X.3 standard. The PAD allows Ascii terminals access to the X.25 packet-switched communications link, which runs at a rate up to 19.2 bit/sec.

DCA is headquartered at 303 Research Drive, Norcross, Ga. 30092.

Hayes Microcomputer Products, Inc.

CHICAGO — The Hayes Stack Smartmodem, an RS-232C-compatible data communications system for small computers, will be introduced in Booths 5607 and 5608 by Hayes Microcomputer Products, Inc.

The Smartmodem, an FCC-approved direct-connect device, is designed for use with RS-232C-compatible computers or terminals to communicate via the telephone system with other computers or time-sharing systems.

A feature of the Smartmodem is that it can be program-controlled in any language by Ascii character strings.

The system analyzes and executes commands and, in response, sends result codes that can be English words or decimal digits. The Smartmodem has auto-dial and -answer capabilities.

All circuitry required for auto-dial and -answer is installed within the Smartmodem, which is a stand-alone system. It can be connected to any telephone system in the U.S., Hayes said, since dialing can be either Touch-Tone or pulse.

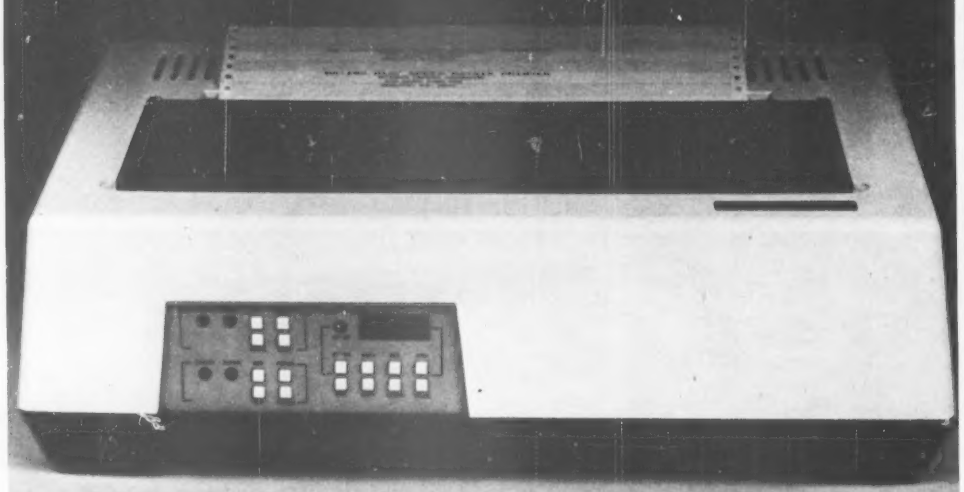
Operation can be in full- or half-duplex with a data rate up to 300 bit/sec. Power-on defaults are controlled by the positioning of seven option switches.

The Smartmodem has a two-year limited warranty. The suggested retail price is $279, which includes the Smartmodem unit, a power pack, one modular telephone cable to connect the unit to the telephone line and an owner's manual.

The Smartmodem will be exhibited in Booths 5607 and 5608 at NCC '81. Other Hayes products that will be on display are the Micromodem II and the Micromodem 100, which are priced at $399 and $379 respectively.

The vendor is located at 5835 Peachtree Corners E., Norcross, Ga. 30092.

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With so many matrix printers on the market today, it may seem tough to find exactly the right one for your application. Some models may offer the speed you need, others the communications flexibility and still others the forms handling capability. But no printer offers **all** the features you need...until now.

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High Speed Printing—Bidirectional, logic-seeking printing at 180 cps offers throughput of over 200 lpm on average text. A 9-wire printhead life-tested at 650 million characters generates a 9x7 matrix with true lower case descenders and underlining.

Non-volatile Format Retention—a unique programming keypad featuring a non-volatile memory allows the user to configure the DS180 for virtually any application. Top of form, horizontal and vertical tabs, perforation skipover, communications parameters and many other features may be programmed and stored from the keypad. When your system is powered down, the format is retained in memory. The DS180 even remembers the line where you stopped printing. There is no need to reset the top of form, margins, baud rate, etc....it's all stored in the memory. If you need to reconfigure for another application, simply load a new format into the memory.

Communications Versatility—The DS180 offers three interfaces including RS232, current loop and 8-bit parallel. Baud rates from 110-9600 may be selected. A 1K buffer and X-on, X-off handshaking ensure optimum throughput.

Forms Handling Flexibility—Adjustable tractors accommodate forms from 3"-15". The adjustable head can print 6-part forms crisply and clearly making the DS180 ideal for printing multipart invoices and shipping documents. Forms can be fed from the front or the bottom.

If you would like more information on how the DS180's low-cost total printer package can fill your application, give us a call at Datasouth. The DS180 is available for 30-day delivery from our sales/service distributors throughout the U.S.

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DELTAVISION

Computer Enhanced Multimedia Training from DELTAK

A New Era in DP Training-DELTAK, the productivity company, announces an exciting new concept in DP education — *Computer Enhanced Multimedia Training*. DELTAK is adding a powerful new dimension to its DeltaVision Library of multimedia training programs by introducing the computer as a fourth instructional medium, integrating it with video, audio and text materials. On an ongoing basis, DELTAK is converting its existing library of more than 800 multimedia DP training programs to Computer Enhanced Multimedia courseware, dramatically increasing its *cost-effectiveness* and *learning productivity*.

Benefits-DELTAK's Computer Enhanced Multimedia Training systems bring many benefits to the organization seeking to improve the productivity of its DP training program.

- *Compression:* Decreases the time required to learn by 30 percent, significantly reducing the most expensive training cost — student time.
- *Cost Reduction:* Dramatically reduces instructor/tutor time, reducing costs and freeing senior personnel to work on critical systems projects.
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- *Simulation:* Simulates real-world DP situations.
- *Validation:* Provides unbiased validation of students' mastery of skills.
- *Consistency:* Ensures a uniform level of skills mastery by all students.
- *Administration:* Automates student enrollment, record keeping and reporting, enhancing the overall management of the training program.

Two Delivery Systems-*IIS/DeltaVision* features courseware developed with IBM's Interactive Instructional System (IIS) and uses IBM 3270 terminals linked to a large-scale computer. *Micro/DeltaVision* features courseware developed with the Professional Authoring Software System (PASS), created by Bell & Howell, and uses a stand-alone APPLE II microprocessor. Both IIS/DeltaVision and Micro/DeltaVision incorporate text, audio and video with computer-presented instruction, creating an *integrated, four-media* training system.

IIS/DV Courses in Development
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CICS Application Design
CICS/VS Command-Level Programming
CICS/VS-DL/I Interface (Command Level)
MVS-JES2 Operator Training
VTAM Network Control

MICRO/DV Courses in Development
Structured ANS COBOL – Entry Level
MVS Job Control Language
VS-OS Utility Programs
MVS-JES2/JES3 Debugging
VSE for Application Programmers
VSAM (MVS and VSE)
System Development
Project Management

Demonstrations-See DELTAK's new Computer Enhanced Multimedia Training systems demonstrated at the 1981 DELTAK International Training Conference, April 27-30, Hyatt Regency Chicago.





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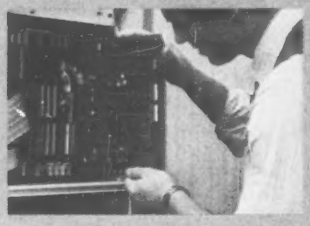
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SPERRY UNIVAC'S TWO NEW FIELD-UPGRADABLE MINICOMPUTERS ARE CHIPS OFF THE V77-800.

At Sperry Univac, we just added two new minicomputers to our V77 family – the V77-500 and V77-700. And provided two cost-effective, high-performance machines that can grow into V77-800s. These new minicomputers join the existing V77-200, 400, 600, and 800, and are fully compatible with our software.

The architecture of both new machines is based on the V77-800 – the leader and most powerful member of our minicomputer family. So with some simple board-swapping, one of our field service representatives can field-upgrade either machine to an ultra high-performance V77-800 in less than four hours. At a very low cost indeed.



Easy board-swapping in the field can upgrade your V77-500 or V77-700.

The V77-500 is a powerful entry-level member of the family, designed for high-performance commercial and data communications processing users. The V77-500 can handle up to one megabyte of error correcting MOS memory. And it provides an entry to a sensible growth path, since it's field-upgradable to the more powerful V77-700.

The V77-700 is designed for an even higher performance commercial and scientific data processing user, and features a new high-speed floating point processor compatible with our new, optimized ANS 77 FORTRAN compiler. And the V77-700, with a maximum memory size of two megabytes, is field-upgradable to the V77-800.

The V77-800, our family leader, features a high-speed central processor, integral 150 ns high-speed cache memory, and a new high-speed floating point processor.

Now end-users can select the exact price/performance model for today's needs. And if you're an OEM who wants to get into vertical markets quickly, maximize your value, and expand your after-market through field upgrades, give us a call. We'll tell you all about our two new family members. And how they can grow on you.

For more information, write to Sperry Univac Mini-Computer Operations, Marketing Communications, 17900 Von Karman Avenue, Irvine, CA 92714.

In Europe, write to Mini-Computer Operations, International Division Headquarters, London NW10 8LS, England.

In Canada, write to Mini-Computer Operations, Headquarters, 55 City Centre Drive, Mississauga, Ontario L5B 1M4.

Or call toll-free **800/854-7517** (8:00 a.m. to 4:30 p.m. PST). In California, call 714/557-9398 collect.

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Communications at NCC

Digital Communications Corp.

CHICAGO — Digital Communications Corp. will be showing its family of Data Mover data communications products in Booths 260, 261 and 262.

The CM9100 is a statistical multiplexer capable of handling from four to 32 input ports, the vendor claimed. The ports can be asynchronous or synchronous. The high-speed link is X.25 Level II.

The SM9200 is a switching multiplexer that has all the features of the CM9100, with local-to-local and local-to-remote connection capability, variable rotary group and port contention and selection, a Digital Communications spokesman said.

The CP9000 is a multimicroprocessor communications processor designed for packet switching and message switching networks, the company said.

Cable Access Processor (CAP) reportedly allows easy and economical interconnection of many data devices on a single coaxial cable bus, such as those used with CATV systems.

The company is located at 11717 Exploration Lane, Germantown, Md. 20767.

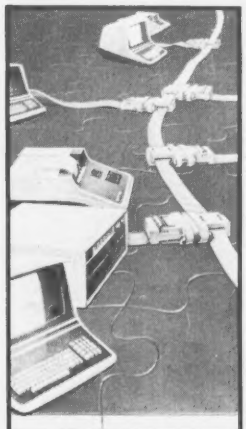
Kontron Electronic

CHICAGO — Kontron Electronic, Inc. will display its PSI80 series of Intelligent Computer Controllers at Booths 4730 and 4731.

The systems are designed to control most processes via IEEE 488 bus, RS-232 and parallel interfaces, a spokesman said.

Moreover, the series can be modularly adapted to any analog or digital source for process control through standard ECB computer boards, according to the company spokesman.

Further information is available from Kontron Electronic, Inc., 630 Price Ave., Redwood City, Calif. 94063.



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Local Computer Network

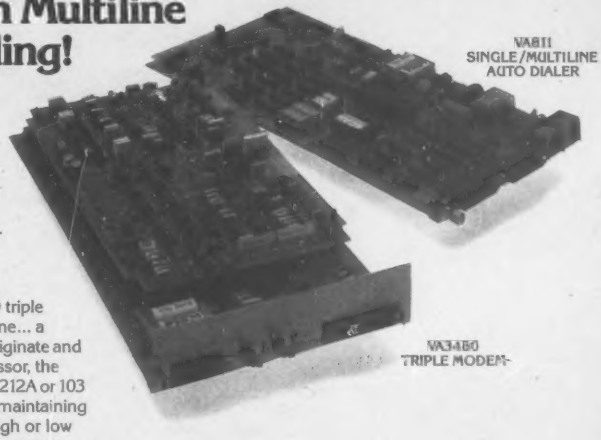
Proven technology, truly modular, solid dealer support and delivery today. That's HiNet.

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Dear Ma:
Now Racal-Vadic has an Originate/Answer Triple Modem with Multiline Dialing!



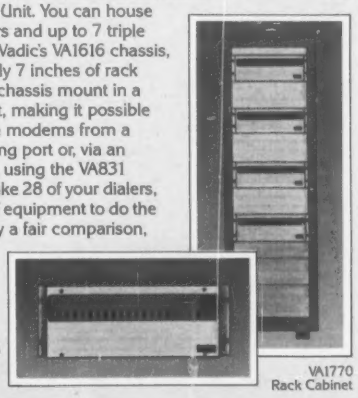
The two PC boards at the right are making it easy for computer sites to standardize on a single modem for all full duplex 1200 and 0-300 bps data transmission over your dial-up network.

Originate/Answer Triple Modem

First there's Racal-Vadic's new VA3480 triple modem. Actually, Ma, it's six modems in one... a VA3400, a 212A and a 103 with automatic originate and answer. Thanks to the built-in microprocessor, the VA3480 can automatically call any VA3400, 212A or 103 remote modem, with the central computer maintaining complete control, including selection of high or low speed modes, and modem ID. In the auto answer mode, the VA3480 changes into a VA3400, 212A or 103, depending on which type modem is calling. It's really a "do everything" modem, Ma.

Single/Multiline Automatic Dialer

The other card is the new VA811 Multiline Automatic Calling Unit. You can house one of these dialers and up to 7 triple modems in Racal-Vadic's VA1616 chassis, which takes up only 7 inches of rack height. 4 of these chassis mount in a 7-foot rack cabinet, making it possible to control 28 triple modems from a single RS366 dialing port or, via an RS232C interface, using the VA831 adapter. It would take 28 of your dialers, and many racks of equipment to do the same thing. Hardly a fair comparison, is it, Ma.



VA3480 Replaces 8 of Your Modems

The VA3480 replaces 8 of your modems — the 103A/E/J, the 113A/B/C/D, and the 212A without altering hardware, software, or changing dial-up disciplines, and it can communicate with all versions of Racal-Vadic's VA3400 as well.

The VA3480 is truly a modem for all reasons, Ma. Better phone or write for full details today. Dial **(800) 543-3000, OPERATOR 510.**

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Alexander Graham Jr.

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Terminals at NCC

Tab Products Co.

CHICAGO — Tab Products Co. will unveil an editing CRT terminal that features a 15-in., nonglare, high-resolution screen. Tab will be located at Booth 938.

The Tab 132/15 has bidirectional smooth or jump scroll, horizontal scroll, split screen, communications speed to 19.2K bit/sec, four pages of display memory and a fully displayed status line, according to the vendor spokesman.

Other features include 80- or 132-col format, 7 by 11 dot matrix characters in a 9 by 14 or 9 by 16 cell, screen-labeled soft keys and English language prompts for setup and operation modes.

The product costs $2,450, the vendor said.

Tab Products Co. is located at 1451 California Ave., Palo Alto, Calif. 94304.

Victor Data Products

CHICAGO — An 80-col bidirectional terminal with four interfaces will be displayed at Victor Data Products, Inc.'s Booth 516.

The Model 5080 printing terminal was designed to conform to stringent computer specifications including software on/off control, status feedback signals and a busy signal if its buffer becomes filled, the vendor claimed.

Choosing one of the four standard interfaces — 8-bit parallel, RS-232, teletypewriter or IEEE-488 — a user can print uppercase and lowercase Ascii characters at 100 char./sec, as well as full graphics at 480 dot col/line.

Victor Data Products is located at 3900 N. Rockwell St., Chicago, Ill. 60618.

Telxon Corp.

CHICAGO — The primary products to be displayed at Booths 5034 and 5133 by Telxon Corp. are the Model 716 data entry terminal and the 787 computer-assisted transaction terminal.

The Telxon 716 is a portable data entry device that records and stores operating data in up to 16K bytes of random-access memory (RAM).

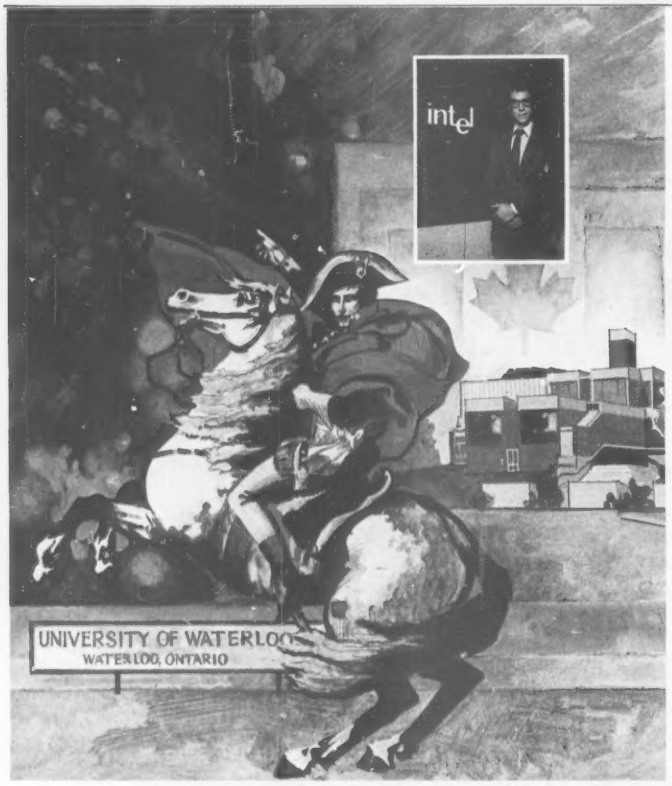
Data is entered via a touch-sensitive keyboard or, optionally, by an optical bar-code reader. Recorded data can be transmitted over telephone lines to a central location for processing.

The Telxon 787 is a hand-held microcomputer that has been enhanced to include a 32-key interchangeable keyboard, full alphabetic capability, expanded program and data storage, two-way communications and printer output options.

The programming can be customized via Telxon's Tel-IV software and the keyboards, via the capability to be interchanged.

A 40-col, 120 line/min output printer can be attached to the unit.

Prices for the 716 and 787 systems depend upon the configuration. The 716 ranges in price from $500 to $1,200 on a purchase-only basis. The 787 system is priced from $900 to $2,300, Telxon said from Ghent Square, Bath, Ohio 44210.



At Waterloo, Intel's FAST-3805 won.

The FAST-3805 saves the University of Waterloo thousands of dollars each month while it increases both user and system productivity. Waterloo's Associate Director-Systems, Romney White, explains how . . .

"Compared to any other DASD, the FAST-3805 in Native Mode* is the fastest thing going. It has a large enough capacity to satisfy the biggest users around, and it's a cost-effective solution. In other words, the FAST-3805 is really an ideal paging device.

"The FAST-3805 reduces paging overhead and increases paging capacity. It's an economical solution for extending current CPU resources."

Increases productivity

"We discovered that our 4341 by itself supported only 25 active users. With the FAST-3805 we were able to double the number of active users at less than half the cost of a new processor. And those users got more consistent and faster response times.

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"On our 3031 we had a page wait of about three percent with two 2305s. However, when we switched to a FAST-3805—which brought in pages about two and a half times faster than the 2305s—the page wait went to zero. In our situation, switching to the FAST-3805 saved us a couple of thousand dollars a month in system and people time. But a user who has a 3033 with a 15 percent page wait could save $15,000 to $20,000 a month.

"Not only did the FAST-3805 take the place of two 2305s and a 2835 controller at Waterloo, but it helped us avoid the purchase of another 2305/2835 system. With the FAST-3805's increased capacity, we were able to stay within our budget . . . and still meet the increased needs of our users.

"Because we wanted to get the most out of our current system, we saw the FAST-3805 as a good investment. We looked at the available paging devices and determined that the FAST-3805, because of its micro-coding, offered the most flexibility.

"The installation was a breeze. Service has been good—and the unit is essentially self-diagnosing. The FAST-3805 is much more reliable than our previous disks.

"In summary, Waterloo got more capacity, better performance and better reliability for less money with Intel's FAST-3805 semiconductor disk."

If you are interested in learning how the FAST-3805 can unleash your system resources and increase your personnel and system productivity, contact Intel's Marketing Information Office at 512/258-5171. Or clip and mail the coupon below.

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*Native Mode and 2305-emulation are two personalities of the FAST-3805 currently available.

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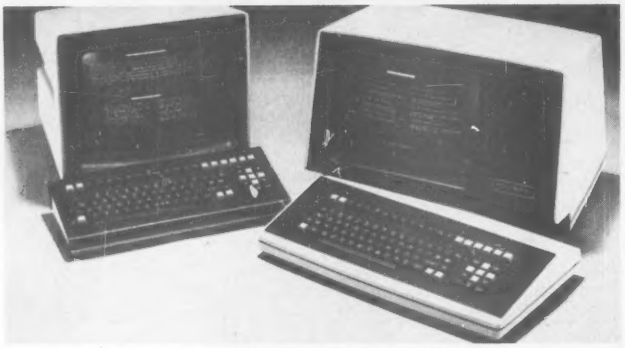
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Terminals at NCC



Ann Arbor Ambassador Terminals

Ann Arbor Terminals, Inc.

CHICAGO — Booths 208 and 209 will feature terminals from Ann Arbor Terminals, Inc. Highlighted in the display will be standard and enhanced versions of the firm's Ambassador terminal, a spokesman noted.

Included among the Ambassador's features are a 60-line display, user-definable host areas and status lines, user-programmable function keys offering a maximum of 64 down-loadable strings, a data line monitor and user-selectable send and print parameters.

The terminals offer both local and remote copy and one of the enhanced versions will display an international keyboard/character set, a spokesman said.

List price for the standard terminal version is $1,300 from Ann Arbor Terminals at 6175 Jackson Road, Ann Arbor, Mich. 48103.

Pencept, Inc.

CHICAGO — Pencept, Inc. is a new company that will be making its debut at Booths 1753 and 1754. On exhibit will be the Pencept System, a one-step approach to data capture and entry that uses dynamic character recognition.

By using Pencept's preprinted form, anyone who can print can capture and enter data, the company said. This system reportedly enables all levels of personnel to turn source information into error-free input, because it provides immediate verification and correction during the data entry operation. By consolidating information capture and entry into a one-step process, the system is said to reduce costs and increase entry speed, accuracy and capacity.

The Pencept System can be used to augment currently installed networks of many IBM terminals, including the 3270 and 3780. Based on a four-terminal cluster system, prices begin at just under $50,000. Pencept can be reached at 1393 Main St., Waltham, Mass. 02154.

Ontel Corp.

CHICAGO — Ontel Corp. will show its OP-1/15 family of intelligent display computers at Booth 2805.

Designed as an intelligent user programmable remote workstation, or a stand-alone system, the OP-1/15 is based on 8085 architecture and can be configured with up to 64K bytes of random-access memory and 16K bytes of programmable read-only memory, the vendor said.

Ontel will also be showing its line of fiber-optic communication links and an interface package to the New World Winchester Disk System, the vendor said from 250 Crossways Park Drive, Woodbury, N.Y. 11797.

Data Engineering, Inc.

CHICAGO — An upgraded display terminal featuring full graphics capabilities and alphanumerics will be displayed at Data Engineering, Inc.'s Booths 4428 and 4429.

The VT100 also features multiple character sizes, dot-dash lines, point plotting and vector drawing.

The terminal is priced at $3,495 with deliveries to start in December from Digital Engineering, 630 Bercut Drive, Sacramento, Calif. 95814.

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Product Name Index
Organized by the full name of each software product and also by abbreviations or acronyms, this index points you quickly to the proper page in the software profile section of the service.

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Terminals at NCC

Informer, Inc.



Informer 314 Model I

CHICAGO — An IBM 3270-compatible stand-alone terminal will be introduced by Informer, Inc. at Booths 411 through 414.

The Model 314 is available in two options. The D, or data entry package, features a full typewriter keyboard, separate numeric keypad, program functions and cursor control pad.

The I, or inquiry package, comes in a styled walnut box with the keyboard in a slide-out drawer.

The Model 314 handles up to 8K bytes of erasable programmable read-only memory (Eprom) and 16K bytes of random-access memory (RAM), the vendor said.

In addition, the 6809 microprocessor-based CRT's expansion port provides access to the system bus, a company spokesman explained.

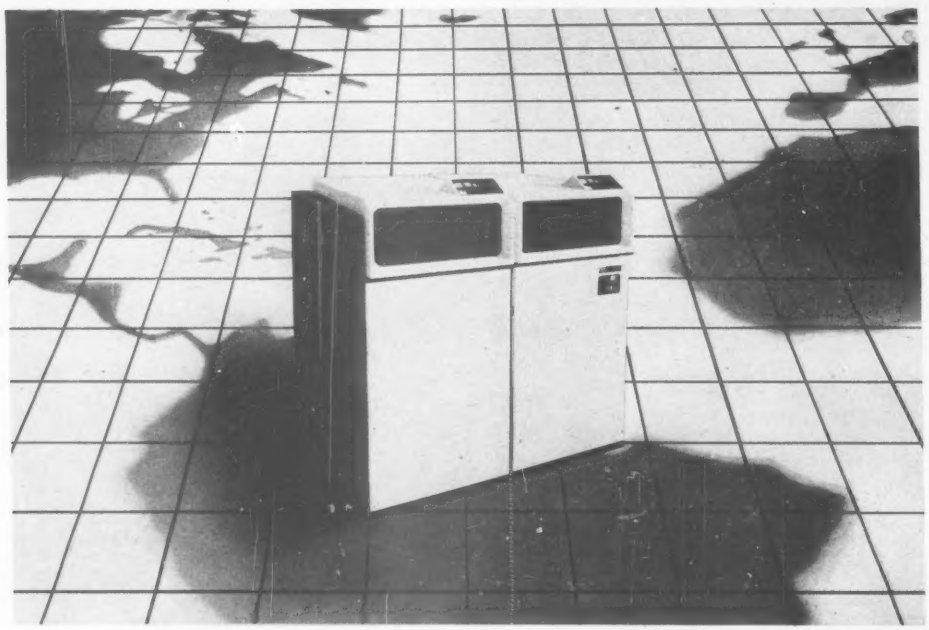
Video Features

Video attributes include reverse video, blinking, underlining and highlighting. Nondisplayable security fields are also standard.

Other features include a printer port with separate communications circuitry, internally synchronized data clocks and a programmable interval timer, the vendor said.

The 314 uses a Z80-SIO protocol interface chip to implement high level bit- and byte-oriented protocols, the spokesman said.

Quantity one price of the Model 314 is $2,600. The unit is available immediately, according to the vendor, which may be reached through P.O. Box 91054, Los Angeles, Calif. 90009.



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Intertec Data Systems

CHICAGO — The full line of products from Intertec Data Systems will be at Booth 847.

Intertec's Compustar multiuser microcomputer system will be featured, according to the vendor. A Compustar system can be configured using any one of the three Intertec disk storage systems (DSS). One is a tabletop 10M-byte Winchester-type drive. Other options are 32- or 96M-byte Control Data Corp. cartridge model drives.

The DSS price range is from $4,995 to $14,995.

Various Intertec video processing units (VPU) can be connected to the DSS via an 8-bit parallel interface, the firm said. Price range of the VPUs is from $2,495 to $4,995.

Also displayed will be the Emulator and Intertube III video terminals for $895 each and the IDS Superbrain and Superbrain QD video systems, both of which run under the CP/M operating system and are priced at $3,495 and $3,995, respectively.

Intertec is at 2300 Broad River Road, Columbia, S.C. 29210.

The Braegen Corp.

CHICAGO — The Braegen Corp.'s Minicomputer Peripherals Division will introduce a 15-in. version of its BT-100 CRT terminal at one of its three booths: 4217, 4218 and 4219.

The Digital Equipment Corp.-compatible BT-100+ includes advanced video and printer port as standard features, as well as an active or passive 20mA-current loop and an RS-232 interface.

Braegen will also display microcomputer systems based on the LSI-11/23, 80M-byte and 300M-byte disk drives and controllers for the PDP-11 and additional CRT displays.

The Braegen Corp. is located at 3340 E. LaPalma Ave., Anaheim, Calif. 92806.

Terminals at NCC

Codex Corp.

CHICAGO — Codex Corp. plans to exhibit the latest addition to its line of intelligent terminals in Booth 1132.

The CDX-68/44 will be shown there along with other Codex products, including the new LC 3650 loop controller, a spokeswoman said. Codex recently announced a 14.4K bit/sec voiceband modem that features a unique signal processing, rather than the usual microprocessor-based, architecture [CW, April 6].

Codex also recently unveiled additions to its Intelligent Network Processor family along with network management systems that allow a user's headquarters to monitor performance of dispersed devices.

Codex is one of the major high-speed voiceband modem manufacturers and, according to company spokesmen, plans to move vigorously into marketing of integrated communications products.

The Motorola, Inc. subsidiary is located at 20 Cabot Blvd., Mansfield, Mass. 02048.

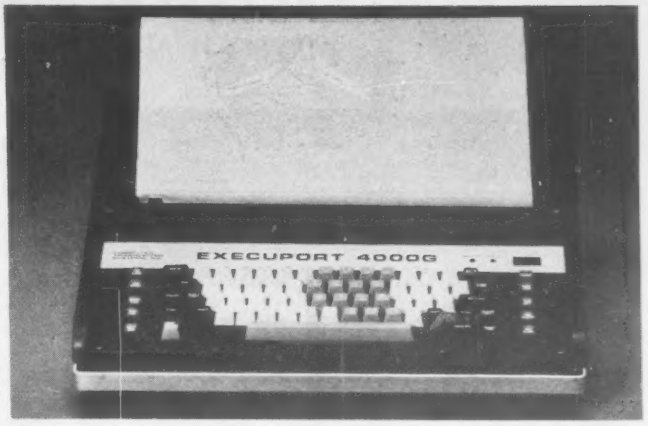
Computer Transceiver Systems, Inc.

CHICAGO — Computer Transceiver Systems, Inc. (CTSI) will be displaying its line of Execuport 4000 terminals at Booths 4607 and 4608.

The 4000 B Bubble Memory Execuport will be introduced at the National Computer Conference. This terminal has 11.5K bytes of integral, nonvolatile bubble memory. Nonvolatile 11.5K-byte bubble cassettes provide additional memory.

The terminal includes a buffer and communicates at 300 bit/sec via a built-in modem and acoustic coupler or up to 9,600 bit/sec via a standard RS-232 connector.

Another new product that will be featured is the Execuport-Sherlock terminal, which reportedly safeguards the privacy of data transmissions by transforming communications into code.



Execuport 4000G

A new version of the 4000 G graphics terminal, which employs Integrated Software Systems Corp.'s software and is offered with both Ascii and APL, will be exhibited at NCC.

The 4000 B sells for $3,795 without cassettes, which are priced at $200 each. The terminals will be available this spring. Execuport-Sherlock terminals cost $3,995 per unit in quantities of 100, and $4,995 per single unit. The latest 4000 G terminal, costing $3,945, is now available.

CTSI may be reached through P.O. Box 15, E. 66 Midland Ave., Paramus, N.J. 07652.

Hazeltine Corp.

CHICAGO — Hazeltine Corp. plans to exhibit its Executive 80 family of data terminals, including the Models 20 and 30, at Booth 741.

Executive 80 terminals feature 80- or 132-character-wide screens and such ergonomic characteristics as nonreflective surfaces, sculptured keyboards and tilt displays. These terminals have RS-232C communications interfaces and allow half- or full-duplex transmission at up to 19.2K bit/sec. Hazeltine is located at Commack, N.Y. 11725.

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Terminals at NCC

General Electric Co.

CHICAGO — General Electric Co. will feature its 1,200 bit/sec matrix printer at Booth 1052. The multimicroprocessor-based Terminet 2120 prints at 120 char./sec and, like GE's previously introduced 2030 printer, offers easy transportability, the firm noted.

Featuring a nine-wire dot matrix mechanism that permits "true underlining" and printing of lowercase descenders, the print head allows for bidirectional printing without fill characters, a spokesman said.

Offering a 150 char./sec catch-up rate, print density is selectable at 10-, 13.2- and 16.5 char./in. along a 13.2-in. print line. Paper handling is provided by a standard friction-feed platen and the 2120 prints 2-, 3-, 4-, 6-, 8- and 12 line/in., he said.

A 20-char., nonvolatile answer-back capability and fully programmable, vertical and horizontal formatting are standard for the 2120, and it also includes a local or remote self-test/diagnostics feature.

Available Options

Available as options for both the 2120 and 2030 printers are a text editor, 300-bit/sec. modem, 16K-byte extended line buffer, international character sets and alternate fonts. The 2120 costs $2,120 for a receive-only unit and $2,195 for a model with a send/receive keyboard.

The company will also exhibit its Terminet 510 correspondence printer that operates at 340 line/min, a recently introduced Model 200 split-platen line printer and the Terminet 200 forms access printer.

All teleprinters and line printers at the exhibit will be controlled by a Terminet 9610 communications controller, according to GE's Data Communication Products Business Department headquartered in Waynesboro, Va. 22980.

Audiotronics

CHICAGO — Booth 323 will be the site of the Audiotronics display of CRT data terminals.

The "Integrated Design" DC-955 features a CRT mounted circuit board said to eliminate the need for a chassis. The design flexibility reportedly improves accessibility to most electrical components without removal of the circuit board.

The 12-in. unit is, except for the CRT, all solid state and features 800 lines of resolution. It complies with the Department of Health and Human Services regulations relative to X-radiation and its components are designed to meet applicable UL standards, the firm said.

The unit costs less than $100 in OEM quantities.

Also displayed will be Model DC-946 of the firm's new "30" series, also featuring 100% solid-state circuitry (except for CRT) for "critical display applications," according to the firm.

Available with composite video or TTL inputs, the 5-in. unit includes a plug-in circuit board to minimize downtime. Other features include geometric distortion of 2% or less, 650 lines of resolution, a 12V dc power supply and standard P-4 phosphor.

The firm is located at 7428 Bellaire Ave., P.O. Box 3997, N. Hollywood, Calif. 91609.

Volker-Craig, Inc.

CHICAGO — At Booths 4612 and 4613, Volker-Craig, Inc. will be spotlighting a new terminal aimed at the Digital Equipment Corp. VT-100 user market.

The VC-2100 offers all the features of the VT-100 plus second page memory; an advanced video option; eight programmable string keys; and a bidirectional, variable speed smooth scroll.

Other non-VT-100 features include a status line, a host-savable set-up control, home and clear keys, local or remote copy and stored set-up mode parameters.

Optional features are RS-449 interface, a current loop accessory, foreign character sets, foreign keyboard layouts and a buffered serial peripheral interface option. The user is also given the optional choice of an amber or green CRT screen.

Volker-Craig is based in the U.S. at 333 Metro Park, Rochester, N.Y. 14623.

Teleray Division

CHICAGO — The Teleray Division of Research, Inc. is introducing an injection-molded enclosure called Style N for all Teleray terminals. The firm is at Booth 1531.

Teleray Models 10, 11, 12 and 100 will be exhibited in the N enclosure. The terminals feature user-programmable function memory and other programmable features, the vendor said.

The firm will also be showing its Model PC-2 peripheral controller for the first time. The unit costs $375 from Teleray Division, Box 24064, Minneapolis, Minn. 55424.

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ACU HAS THE FACTS

Terminals at NCC

Computer Devices, Inc.

CHICAGO — An internationally configured receive-only data terminal from Computer Devices, Inc. will be on display for the first time at Booth 1232.

Called the Miniterm Model 1201, the new printer replaces the company's current Model 1201, introduced in 1976.

Designed for on-line applications requiring hard-copy output or for use as a remote or stand-alone printer terminal, the Model 1201 features a standard 2K-byte buffer, polling, self-testing, a serial interface and a selectable 50- to 60Hz international power supply.

Standard Features

Like the earlier model, the upgraded Model 1201 offers as standard 80- or 132-col switch-selectable printing; print speeds up to 50 char/sec; adjustable print darkness; a 96-char. uppercase and lowercase Ascii code with underscore; remote terminal reset; and user controls for paper feed, on-line and off-line, reset and self-test, the vendor said.

Options include high-resolution plotting, answer-back, an optional 4K-byte buffer, 20mA-current loop and 9,600 bit/sec communications, the vendor said.

The Model 1201 costs $1,385 and is available 60 days ARO, the vendor said from 25 North Ave., Burlington, Mass. 01803.



Redesigned Miniterm 1201

Telex Computer Products, Inc.

CHICAGO — Telex Computer Products, Inc. will introduce a communications keyboard printer at Booth 1653, as well as an optional block-mode version of the Telex 310 Ascii terminal.

The Telex 767 tabletop printer, compatible with IBM's 3767, is designed to transmit and receive data from an IBM system using either Systems Network Architecture/SDLC or 2740 line protocol, according to a company spokesman.

It can be also used both on- and off-line for interactive or batch operations.

Block-Mode Option

Aimed at IBM Series/1 users, the block-mode option on the Telex 310 terminal is said to emulate the capability of comparable IBM 3101 Model 22 and Model 23 terminals.

The exhibit will also feature the first public demonstration of Telex 278 Models 3, 4 and 5, IBM 3270-compatible terminal models with enlarged screen sizes.

Also exhibited at Booth 1653 will be the SDLC version of the Telex 276 controller, 281, 286C and 287C printers, the Telex Series 80 magnetic tape subsystems and the OEM 6200 series tape subsystems.

Telex is located at 6422 E. 41st St., Tulsa, Okla. 74135.

Darryl Lloyd, Inc.

CHICAGO — Darryl Lloyd, Inc. will be showing a series of smart CRT terminals with a tactile feel keyboard in Booths 542 and 543.

The Series 630 Data Screen terminal features a detached keyboard with 79 keys, auto repeating after .75 sec and six function keys capable of generating 16 two-char. code sequences, a Darryl Lloyd spokesman said.

Switch-selectable features include eight data transfer rates from 110 bit/sec through 9,600 bit/sec; 10- or 11-bit serial asynchronous Ascii data with odd, even or mark parity; RS-232C interface; half or full duplex; line, page and partial transmit.

A single unit costs $1,000, the vendor said from 2727 N. Fairview Ave., Tucson, Ariz. 85705.

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Systems at NCC

Sperry Univac

CHICAGO — Sperry Univac will be exhibiting industry-oriented applications packages and application development tools for the company's Series 1100 and System 80 mainframes, V77-800 minicomputer and communications terminals. The firm will be located in Booth 4112.

Demonstrations of Series 1100 capabilities will be via UTS 400 terminals connected to an 1100/61 mainframe system in Eagen, Minn.

Interactive applications currently available on the workstation-oriented System 80 to be demonstrated include a general accounting system and packages for the manufacturing and wholesale distribution industries.

The V77-800 minicomputer system will be demonstrated with intelligent terminals and a complement of peripherals. It will be shown in an on-line real-time environment running under the Vortex II operating system with the Pronto transaction processing system.

A text processing utility package for the UTS 40, which includes capabilities to create, modify, print and transmit to a host and locally store/retrieve text from diskette, will also be demonstrated.

Sperry Univac may be reached through P.O. Box 500, Bluebell, Pa. 19424.

Honeywell, Inc.

CHICAGO — In a 2,000-sq-ft exhibit in Booth 1141, Honeywell, Inc. will display a satellite DP installation with workstations communicating on-line to the company's host computers located in Phoenix and in Billerica, Mass.

The exhibit will feature Honeywell's Distributed Systems Environment (DSE) as well as the DPS 6/92 32-bit "supermini" class small system; a DPS 6/32 16-bit small computer with the WP 6 word processing facility; the high-speed, nonimpact Page Processing System (PPS II); and visual display terminal work stations, printers and peripherals. The exhibit will feature demonstrations of distributed processing using the DPS 6/32's word processing facility. A document will be created, edited and printed.

In a demonstration of the communications capabilities of the DPS 6 to DPS 8, using Honeywell's Remote Network Processor 6 software, the document will be transferred to a DPS 8/20 host in Phoenix. A control program in Phoenix will transfer the document back to the Honeywell booth in Chicago to be printed by the PPS II.

The DPS 6/92 ranges in price from $300,000 to $600,000, and the DPS 6/32 is priced from $28,800 to $75,000, depending on the configuration. WP 6 software can be purchased for between $3,000 and $5,000, depending on the configuration.

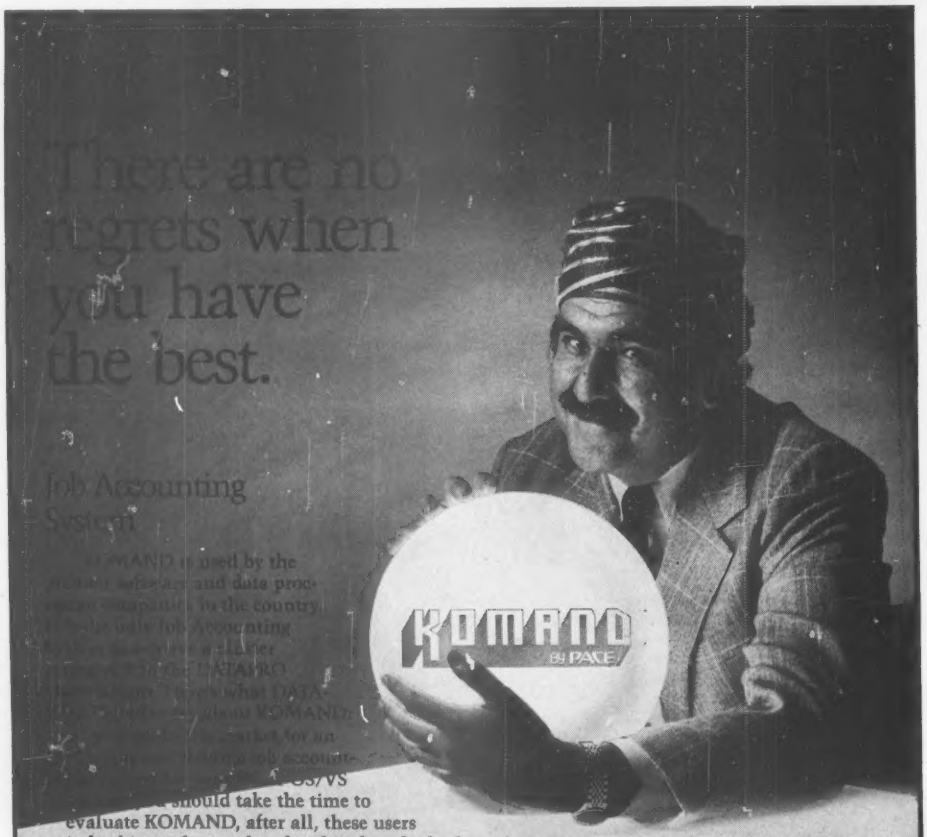
Honeywell is located at 200 Smith St., Waltham, Mass. 02154.

Telefile Computer Products, Inc.

CHICAGO — Telefile Computer Products, Inc. will demonstrate at Booth 2714 its T-85 computer system, a plug-compatible and software-transparent replacement or upgrade for the Xerox Corp. Sigma 5, 6, 7 and 9 users.

A 192K-byte T-85 CPU is priced at about $92,000 with delivery in 90 to 120 days.

Telefile Computer Products, Inc. is at 17131 Daimler St., Irvine, Calif., 92714.



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Systems at NCC

IBM

CHICAGO — IBM's latest Series/1 processors, the 4952 Model C and 4955 Model F, will be the only product IBM will be showing this year at Booth 1126.

The firm's Data Processing Division (DPD) will show the same products it demonstrated last year. The 8100 line, featuring the Distributed Office System, designed to streamline document creation and printing among other data processing functions, will be on display.

Entry-Level 4331

The 4331, DPD's entry level processor, will be demonstrated along with the 3279 color display station, which made its show debut at last year's NCC in Anaheim, Calif.

DPD will also be showing its 3101 Ascii display terminal which can be attached to IBM as well as some other vendor's computer systems.

IBM's General Systems Division (GSD) will demonstrate its System/38 that features workstation support, on-line data base functions and single level virtual storage.

GSD will also show the 5280 distributed data system with an order entry package and the 5520 administraton processing system with text processing and electronic document distribution packages. The Series/1 family will also be on display with several applications, IBM said.

Office Products Division will show Displaywriter, a word processing system with communications capabilities to large IBM processors, the Electronic Typewriter 75, the Executive copier Model 102 and the 6670 Information distributor, a laser-based electronic transmission system.



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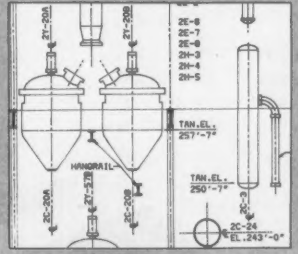
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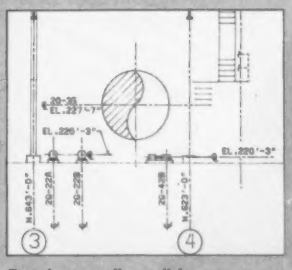
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Peripherals at NCC

Nicolet Zeta Corp.

CHICAGO — A 36-in., four-pen intelligent digital drum plotter from Nicolet Zeta Corp. will be on display at Booth 338.

The Zeta 3620 features 35 in./sec axial speed, 4G acceleration, 0.00049-in. resolution and continuous feed paper for unattended multiple-plot operation, the company said.

Two 16-bit microprocessors control the linear actuator pens and proprietary servo-motor drive system. Other intelligent features include windowing, LCD plot time display and built-in diagnostics, the company added.

Also on display at Booth 338 will be Zeta's Model 5400 54-in. plotter and two 12-in plotters, Models 14563 and 1553.

Nicolet Zeta Corp. is located at 2300 Stanwell Drive, Concord, Calif. 94520.

Alpha Data, Inc.

CHICAGO — Alpha Data, Inc. will be displaying three mass memory systems in Booth 403.

The Atlas mass memory disk drive, Alpha's newest offering, is a hybrid disk memory in a sealed enclosure suitable for rack mounting. Its moving head storage offers 10M bytes, 20M bytes or more; fixed-head disk storage is 256K- or 512K bytes. All circuits are on interchangeable printed circuit boards. It will be availabie in July.

M/Core is a high-speed, nonvolatile memory system designed for ultra-fast mass storage requirements, the vendor said. The core memory is 128K word by 18 bit and is expandable. Larger systems can be configured by daisy chaining, Alpha Data said.

The Model 80 is a mass disk memory unit capable of storing up to 64 million bits. It is a rack-mounted unit requiring no preventative or periodic maintenance.

Its disk head configuration permits use in harsh environments, the vendor claimed.

Complete details on Alpha Data products are available from the company at 20750 Marilla St., Chatsworth, Calif. 91311.

Applicon, Inc.

CHICAGO — An ink-jet Color Plotting System for making full-color plots from digital data will be the highlight of Applicon, Inc.'s Booths 5716, 5717 and 5718.

The system consists of an off-line plotter with magnetic tape unit, along with a set of Fortran subroutines for processing data on the user's host computer. Application packages for mapping, scanning, charting and 3-D display are available.

The Color software system automatically converts commands into raster format for output to the plotter.

Three Ink Jets

The system's three ink jets, in magenta, yellow and cyan, record onto paper, acetate or other media at 125 point/in.



Color Plotting System

Full size plots can be produced in 8½ minutes.

The system, with magnetic tape unit, costs $59,000 from the firm at 32 Second Ave., Burlington, Mass. 01803.

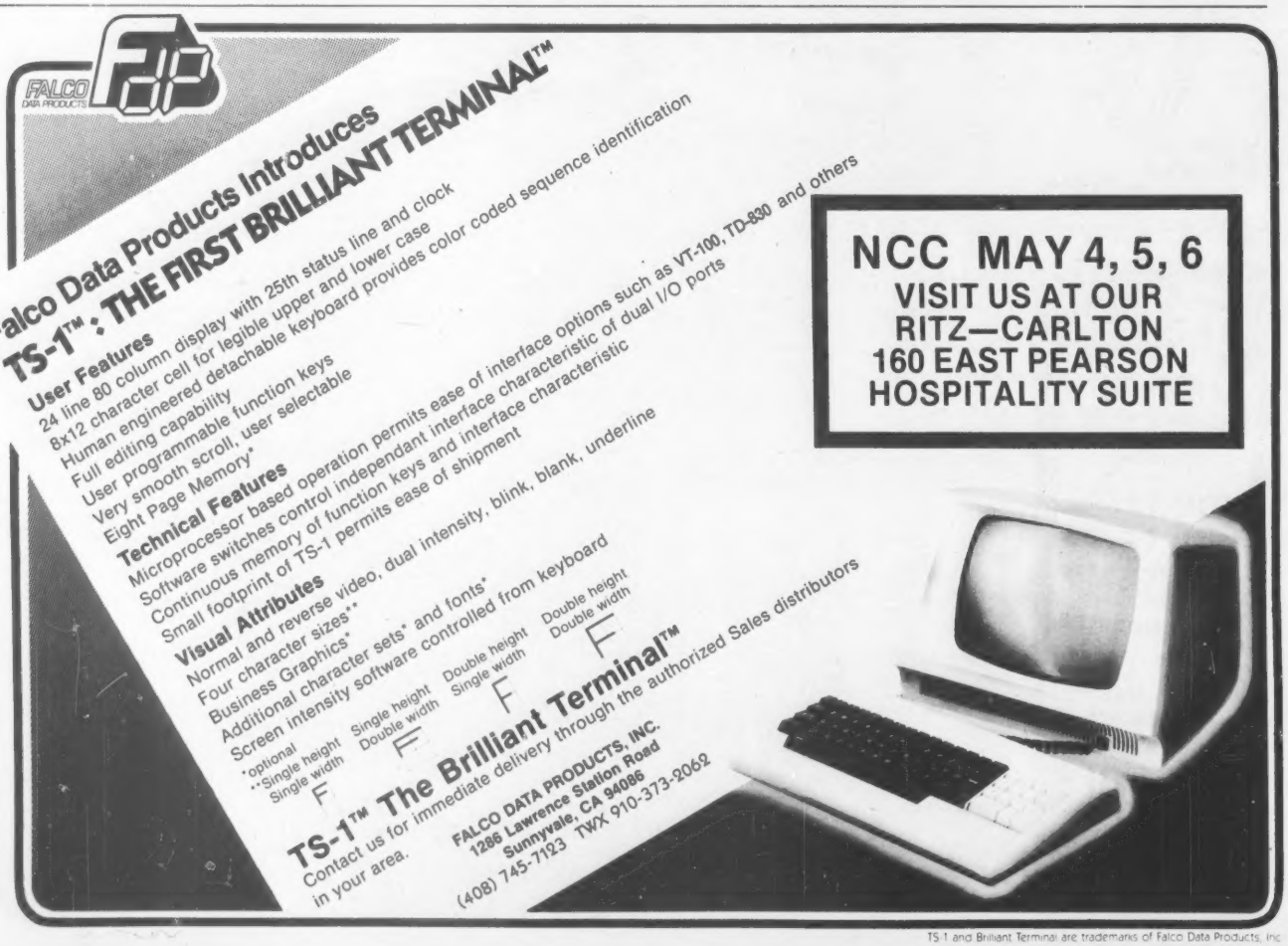
GNT Automatic, Inc.

CHICAGO — A tape reader and punch station designed to economize space and said to perform punching and reading simultaneously or independently will be displayed at Booth 3004 by GNT Automatic, Inc.

The 4601 features a microprocessor-controlled interface with buffer memory and has skip-delete and full tape editing features, the company said.

With a delivery time of 30 days, the 4601 is OEM-priced at $2,295.

GNT Automatic, Inc., is headquartered at 1560 Trapelo Road, Waltham, Mass. 02154.



TS-1 and Brilliant Terminal are trademarks of Falco Data Products, Inc

Peripherals at NCC

Olivetti Peripheral Equipment



The DM 5050

CHICAGO — A 100 char./sec monodirectional dot matrix printer will be announced by Olivetti Peripheral Equipment at Booth 1460.

In addition, the company's line of thermal, daisy wheel and dot matrix printers plus fixed and flexible disk drives will also be exhibited.

The new printer, the DM 5050, is a 100 char./sec monodirectional desktop printer that prints 80 or 132 7 by 7 dot matrix characters, or elongated characters, on an 8-in. line, with six lines to the vertical inch, the vendor said.

The unit has a 1K buffer and industry standard 8-bit parallel interface, but RS-232C or 20mA current loop are optional, the vendor said. Standard are 8-½-in. rear friction feed and 9-in. pin feed; optional are 8-½-in. front feed, 9-in. forms tractor and paper roll.

DM 5050 measures 13-¾ in. wide, 11-½ in. deep and 5 in. high. Available in June, the unit will be priced around $500 in OEM quantities.

Two Olivetti thermal printers will also be on display.

The TH 240 is a high-speed printer with alphanumeric and graphics capability. The unit prints a full 24-line screen page in six seconds.

The THM 2125 is a thermal printing mechanism suitable for Kanji character printing and graphics applications. It prints 1,085 dots across the width of the paper at 620 dot/sec on 24 lines, the vendor said.

Three daisy wheel printers will be shown.

The DY 211 is a 20 char./sec bidirectional printer with 13-in. platen, 17-in. forms width, four printing pitches and parallel or serial interface.

The DY 311 is a 32 char./sec bidirectional printer with 15-in. platen, 17-¼-in. forms width, four printing pitches and industry standard interfaces.

The DY 811 is a 65 char./sec bidirectional unit with a peak speed of 80 char./sec. The printer has a 15-in. platen, 17-¼-in. forms width, four printing pitches and serial RS 232C or 20mA current loop interface.

In addition to the new DM 5050, Olivetti will also display its DM 80/180 dot matrix printer.

The DM 80/180 is a dual speed, dual definition unit that prints 180 char./sec drafts and 80 char./sec letter quality. The unit has a 15-in. platen, 17-¼-in. maximum forms width and serial RS-232C or 20mA current loop interface.

Flexible disk drives can also be seen at the Olivetti booth. The FD 500 series 5-¼ in. and the FD 800 series 8-in. flexible drives incorporate industry standard interfaces and are single or double sided.

Two fixed disk drives will be shown. The HD 500 series 5-¼-in. drives feature Winchester technology, 6.3M- to 19.5M-byte storage capacity, mini-floppy like or bidirectional bus interfaces. The HD 800 series 8-in. drives feature Winchester technology, bidirectional bus interfaces and 26M- to 43.5M bytes of storage capacity.

Olivetti OPE is located at 505 White Plains Road, Tarrytown, N.Y. 10591.

Remex Division Of Ex-Cell-O

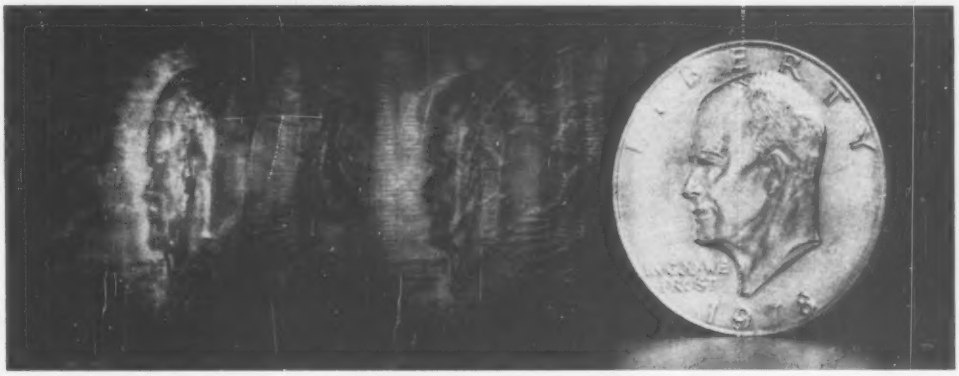
CHICAGO — The Remex Divison of Ex-Cell-O Corp. will unveil a line of 5.25-in. flexible disk subsystems that reportedly appear to host computers as punched tape peripherals.

The punched tape emulators provide high-speed data transfer and data storage on the flexible disk drive while operating with existing punched tape software and system configurations, a spokesman said.

Flexible disk drives used in the system are low-profile, 5.25-in. media models measuring 2.25-in. high. Read speed is 150- to 1,000 char./sec. With the serial interface, bit/sec rates to 9,600 bit/sec can be achieved.

The price is $1,795, the vendor said. Remex may be contacted through P.O. Box C19533, Irvine, Calif. 92713.

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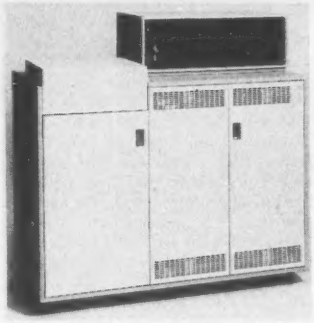
Peripherals at NCC

Datagraphix, Inc.

CHICAGO — A microfiche recorder, microfiche reader, laser printer and CRT display terminal from Datagraphix, Inc. will be displayed at Booth 1147.

The Online Autocom II recorder is configured as a 3211 printer and interfaces directly with the IBM 360/25 and above, with 370, 30 series or 4300 series. It reportedly processes data into fully titled and indexed microfiche at speeds up to 12,000 line/min.

The Deskmate microfiche reader is said to fit into any standard office desk drawer and offers a dual-lens option allowing the user to switch between source document and COM-generated microfiche.



Online Autocom II

Datagraphix will also show its 9800 series laser printers featuring speeds up to 21,000 line/min. The on-line model is plug-compatible with IBM 370/145 and above, 30 series, 4300 and IBM-compatible host computers. Off-line models accept unformatted print data sets on magnetic tape from "a wide range of host computers," according to the firm.

The Model 132-1 is the latest addition to the firm's family of 132-col interactive display terminals. Microprocessor-controlled, the unit offers a 96-char. Ascii set, cursor control, tabbing, dual brightness and multiple asynchronous transmission modes in full- or half-duplex at 300- to 19.2K bit/sec.

Datagraphix can be reached through P.O. Box 82449, San Diego, Calif. 92138.

Pertec Computer Corp.

CHICAGO — Pertec Computer Corp.'s Peripherals Division will display its full range of products in Booth 832.

The division designs, manufactures, markets and services a line of digital magnetic tape transports, rigid disk drives, flexible disk drives, controllers and serial printers.

Among those products to be displayed are the company's Mini-Wini, 20M-byte 8-in. Winchester disk, the Stylist 360 daisy wheel printers and the Pertec P 250 high-speed matrix printer.

Pertec sells its peripherals primarily on an OEM basis.

The Peripherals Division is located at 21111 Erwin St., Woodland Hills, Calif. 91367.

Rutishauser of America, Inc.

CHICAGO — A double-bin sheet feeder fitting Diablo Systems, Inc., Qume Corp. and other word processing and computer printers will be exhibited by Rutishauser of America, Inc. at Booth 572.

The Series 950 will insert cut sheets from either bin, print and then stack printed sheets in collated order. The feeder attaches to the top of the printer, engaging the platen drive gear, which then drives the feeder.

Each bin has a capacity of 200 sheets. A wide variety of sheets are accepted; adjustable paper guides adapt to the width of the sheet.

The product costs $2,195, the vendor said from 9677 Wendell Road, Dallas, Texas 75243.

Dastek Corp.

CHICAGO — Two moving-head, random-access disk drives said to utilize fixed media and state-of-the-art technologies in read/write heads, data encoding and decoding head positioning will be displayed at Booths 1755 and 1756 by Dastek Corp.

Capacities for both the 4830 and 4835 are 203M-, 339M-, and 407M bytes unformatted, and access times are 5 msec track to track with 25 msec average, the vendor said.

The 407M-byte Models 4830-3 and 4835-3 disk drives are OEM-priced at $8,750 in quantities of 250. Pricing information on the other models is available from Dastek Corp., 141 Albright Way, Los Gatos, Calif. 95030.

Decitek Corp.

CHICAGO — Decitek Corp. (Booths 1750 and 1751) will show its line of Shugart-compatible double-sided 8-in. floppy disk drives, including the Model 8302.

The 8302 is compatible with Shugart's 851R double-sided 8-in. floppy drive. The unit comes with a linear stepper motor and board diagnostics.

The vendor is based at 129 Flanders Road, Westboro, Mass. 01581.

Peripherals at NCC

California Computer Products, Inc.

CHICAGO — A controller capable of driving both pen and electrostatic plotters will highlight California Computer Products, Inc.'s Booth 733.

Calcomp's Model 953 Controller is said to operate either on- or off-line and to relieve the host computer of vector-to-raster conversion. Up to eight Calcomp electrostatic units and one Calcomp pen plotter can be operated from one 953, according to the manufacturer.

System components include a microprocessor with 256K bytes of vector memory, modules for plot data processing, vector-to-raster conversion and raster output.

In addition, 21M bytes of rigid disk memory or an extra 256K bytes of semiconductor memory are available as an option.

The controller's basic price lists less than $30,000.

Also featured by Calcomp will be the Model 1060 plotter, said to combine the space-saving features of a drum plotter with the performance of large flatbeds. The unit's basic price is $41,120 from the company at 2411 W. LaPalma Ave., Anaheim, Calif. 92801.

Facit, Inc.

CHICAGO — Four matrix printers, two CRT terminals, a punched tape reader family, a tape punch/reader combination, a tape punch and an intelligent cassette tape recorder — all from Facit, Inc. — will be on display at Booth 918.

Of special interest is the Facit 4410 CRT terminal, an asynchronous alphanumeric Ascii terminal that represents the low end of Facit's CRT terminal family.

The terminal features 24 lines of 80 characters each on its 12-in. green nonglare screen.

CRT Features

The unit incorporates normal or reverse video, separate cursor positioning keys, separate numeric keyboard, editing facilities, character or page transmission (block send), a printer port and three emulating modes (Lear Siegler, Inc. ADM-3A, Hazeltine Corp. 1410 and Facit 4410 Extended) and a transparency mode, the vendor said.

The terminal features a 128-Ascii character set with 5-in. by 7-in. characters with true descenders in a 7-in. by 10-in. field.

The interface is user selectable V.24/RS-232C without modem control or 20ma current loop. Data rates are 110-, 300-, 600-, 1,200-, 2,400-, 4,800- and 9,600 bit/sec, according to the vendor.

The Facit 4410 costs $995 and is available for immediate delivery. Facit, Inc. is located at 66 Field Point Road, Greenwich, Conn. 06830.

BASF Systems Corp.

CHICAGO — At Booth 952, BASF Systems Corp. will show a variety of new hardware and software products, including a series of fixed disk and mechanical-only versions of its small floppy disk drives.

Products that will be debuted by the firm's Computer Media Department include two Control Data Corp.-compatible drives, a 16M-byte "Phoenix" disk cartridge and a 300M-byte storage module. Also unveiled will be a small rigid disk for the OEM marketplace, head alignment disks for use in floppy disk drives and a head cleaning Flexydisk, a spokesman noted.

The 6180 series of fixed disk drives, introduced at the show, reportedly offer a greater capacity and higher reliability than competing versions in the same size class. The Model 6182 in the series offers 6M bytes of unformatted capacity on two platters, while the 6183 features 10M bytes on three disks. Both have a track-to-track access time of about 2 msec, an average access time of 100 msec and a transfer rate of 5M-bit/sec, the spokesman claimed.

Also highlighted at the BASF booth will be the 6107/09 mechanical-only version of the 6106 single-headed amd the 6108 double-headed floppy disk drives. The drives were previously announced, but are being displayed for the first time at the NCC.

BASF is headquartered at Crosby Drive, Bedford, Mass. 01730.

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High-volume information processing comes easy to Wang Virtual Storage computer systems. Virtual memory management gives each VS user a full megabyte of logical address space for big-program development and execution. Multiple Input/Output Processors work independently to break the I/O bottleneck, buffering the CPU for faster throughput. And our sophisticated VS instruction sets cut through complex tasks with ease.

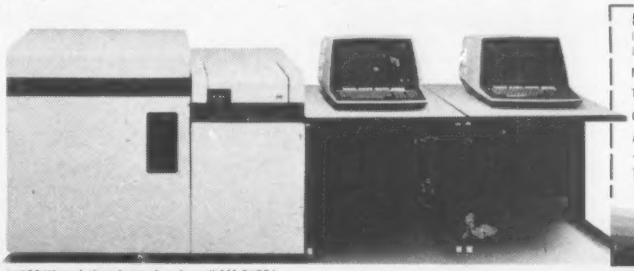
Expansion is easy, too. The VS family lets you grow from 6-user support on the VS 50 to 32 users on the VS, to 128-user support on VS 100 systems. Use up to 2 million bytes of main memory and 4.6 billion bytes of mass storage. And get an eight-fold increase in processing speed with the VS 100's 32-bit processor, 64-bit data path and 32K-bytes of integral cache memory. While protecting your software and peripheral investment every step of the way.

Unsqueezed.

But Wang VS systems aren't just powerful computers. They're complete systems that make computer power ingeniously easy to use. Our programming aids, for example, let you create a data entry screen as easily as writing a word processing document. Our Symbolic Debug utility lets you test and modify COBOL, BASIC, RPG II and Assembler programs at the source level. And our menu-driven file management facilities let you set up files, process transactions, generate reports and establish field-level security controls — interactively.

In all, Wang VS systems give you more easy ways to use computer power than any other system marketed today. Word processing, phototypesetting, electronic mail and telecommunications are all VS system options.

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the 32 you'll find such comfort-increasing features as a detachable keyboard that eliminates unneces-



will make you the long run.

sary twisting and turning. A 12" or 15" screen (30.5-38.1 cm.) that eliminates hunching and bunching. And a non-glare screen with optional tilt that eliminates squinting and squirming. And as a special added feature, you'll find visual attributes with complete editing to highlight and format the display. Plus, two pages of memory that allow you to enter data on one page while transmitting from the other.

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Intermediate Terminal is a trademark of Lear Siegler

Peripherals at NCC

Iomega Corp.

CHICAGO — At Booths 1647 and 1648 here, Iomega Corp. will introduce a 10M-byte removable cartridge and storage subsystem for OEMs.

The company also announced an agreement whereby American Microsystems, Inc. (AMI) will develop and manufacture custom large-scale integrated (LSI) circuits for Iomega's new system, Alphaten.

The new product includes a disk drive, an integrated controller and a 10M-byte flexible media cartridge. Its features include a 10M-byte formatted capacity; removable 10M-byte flexible media cartridge; 1.13M byte/sec data rate and 35 msec average access time.

Alphaten runs on 35 watts, including the integrated controller. Iomega said the system is intended for OEMs requiring a high-performance, high-reliability, direct-access storage system with 10M-byte capacity on a flexible, removable medium.

Under the agreement with AMI, the company will develop proprietary customized LSI circuits that will be used in the integrated controller for Alphaten.

Alphaten is priced at $2,300 for OEM quantities of 500 per year, including disk drive and integrated controller, which will operate up to four drives. Additional drives cost $1,250 each. Preformatted 10M-byte cartridges are priced at $30 each in OEM quantities.

Iomega anticipates shipping evaluation Alphaten systems by the last half of 1981. The company is located at 4646 S. 1500 West, Ogden, Utah 84403.

Siemens Corp.

CHICAGO — Siemens Corp. will display its ND 2 laser printer at Booth 2811.

The nonimpact printer reportedly can output 21,000 line/min and features a buffer to hold one or more pages of information. Its nonstop printing rate with fanfold paper is about 8,800 12-in. forms per hour, a spokesman said.

Siemens is at 186 Wood Ave. S., Iselin, N.J. 08830.

Comtal Corp.

CHICAGO — Comtal Corp., a subsidiary of 3M Corp., will introduce a stand-alone digital image processing system in Booth 2504.

The Vision One/10 system was designed as an entry-level system for the first-time user of digital image processing techniques, the vendor said.

An interactive stand-alone image processing system, Vision One/10 operates in real-time 1/30 sec, Comtal said. Its memory has a capacity of up to four 512-by-512 eight-bit images and up to four 512-by-512 one-bit graphic planes.

A Digital Equipment Corp. LSI-11/02 computer/controller with a programmable read-only memory operating system is used. There is additional random-access memory space for user code. Vision One/10 has a pseudocolor processor.

A complete Vision One/10 system will cost less than $55,000, the vendor said from 5118 Vineland Ave., North Hollywood, Calif. 91601.

Practical Automation, Inc.

CHICAGO — An impact matrix printer for tickets, forms or cards will be offered by Practical Automation, Inc. at Booths 1505 and 1506.

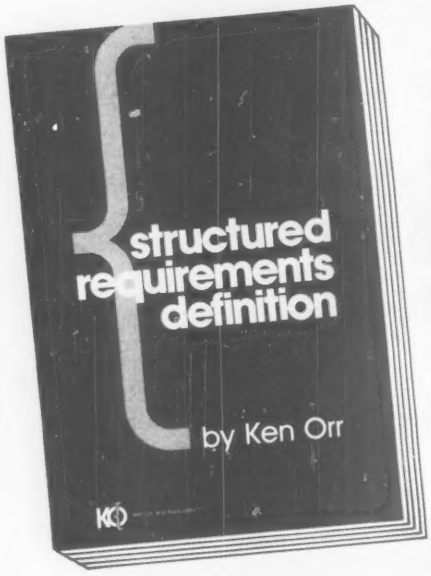
The PK 970 ticket printer features a 64-char. alphanumeric Ascii subset on manually inserted tab cards and produces one to four copies 3.25 in. wide and of variable length, the vendor claimed.

The printers are self-contained, requiring only logic inputs, control signals and line power, a spokesman said.

The thickness of the card or tab set determines the setting of the head-to-platen distance. This is normally factory set for optimum printing to customer specification, but it can reportedly be field-altered

The price is $712, the vendor said from Trap Falls Road, Shelton, Conn. 06484.

NCC Booth #5131



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Peripherals at NCC

T-Bar, Inc.

CHICAGO — The introduction of T-Bar, Inc.'s Intelligent Matrix Control (IMC) product will be featured in the firm's display at Booths 326 through 329.

Designed to offer computer control for T-Bar's 3900 series matrix switching equipment, the 3919 IMC is reportedly comparable in application to IBM's 3814 switching management system.

The addition of T-Bar software and CRT control provides users with facilities for status inquiry, reconfiguration from prestored "Do Lists" and restoral by interchange between predefined system configurations, a spokesman said.

Able to handle up to eight switching matrices in any T-Bar size with a maximum of 1,152 nodes, the 3919 IMC offers manual backup at each matrix, he claimed.

With 90-day availability, pricing begins at $27,000 for two-matrices control and each two-matrices increment costs an additional $2,800.

Other products featured will be the company's Virtual Switch Matrix (VSM) that provides a large-scale RS-232 matrix to switch up to 19.2K bit/ sec.

With a delivery lead time of approximately six months, price range of the VSM is from $100,000 to $350,000, depending on the number of data lines to be switched.

T-Bar will also exhibit its Multiple Access Switching System that provides for early detection and diagnosis of network failures and malfunctioning equipment and its Explorer family of diagnostic test equipment. The firm is at 141 Danbury Road, Wilton, Conn. 06897.

Key Tronic Corp.

CHICAGO — Key Tronic Corp. will show National Computer Conference attendees a slot-type optical character recognition (OCR) peripheral known as the MR-10.

Key Tronic's OCR Division will show the device, which reportedly can read single line encoded characters on a document manually inserted through a slot, in Booth 1416.

MR-10 costs less than $1,000. Key Tronics is based at 914 W. Sprague Ave., Spokane, Wash. 99204.

Nashua Corp.

CHICAGO — Nashua Corp.'s Computer Products Division will highlight its exhibit at Booths 4221 and 4222 with a 10M-byte high-density disk cartridge.

The Model 4424 Cynthia cartridge is compatible with CII-Honeywell-Bull D120 and D140 drives and features an embedded servo configuration.

Worldwide Licensee

Nashua is the worldwide licensee for this unit, according to a Nashua spokesman."

The suggested retail price in quantities of 10 or less is $225.

Also included in the display will be disks and diskettes of various sizes, storage modules, disk packs, cartridges for RL01 and RL02 drives and top- and front-loading cartridges, the spokesman said.

Nashua is located at 44 Franklin St., Nashua, N.H. 03061.



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Gene Clem
Lead Systems Programmer

Vince Rosenthal
Divisional Information Services Manager

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The Construction Machinery Division of Clark Equipment Company has used Series 80 MANTIS, the most advanced application development system, to put productivity where it really counts—at the bottom line.

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"After installing Series 80 MANTIS, our ability to build applications increased 180%, resulting in 50 new applications in nine short months. Today, we're not only keeping pace with demand, but seeking new cost saving on-line applications to build for the future. For any corporation, this is where data processing can improve productivity."

Series 80 MANTIS is Cincom's dramatic breakthrough in application development technology. Only MANTIS provides complete beginning-to-end on-line application development, without the need for batch processes.

For many companies like Clark Equipment, application backlogs are becoming a thing of the past. Programmer morale is up. End-users are happier. And most important, data processing productivity is helping the corporation where it counts most—at the bottom line.

MANTIS is an integral component of Cincom's Series 80 family of data base/data communications products. To see how MANTIS can help improve your productivity, contact our Marketing Services Dept. for a demonstration. At your site or at a Cincom Service Center.

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Cincinnati, Ohio 45211

Peripherals at NCC

Burroughs OEM Marketing

CHICAGO — Burroughs OEM Marketing will exhibit its new SP110 serial printer in Booth 1156.

The first in a new line of serial printers designed for both general purpose and telecommunications use, the SP110 offers such features as bidirectional printing at 90 char./sec, up to 136 char./line, character-mode operation and alternate and optional national character sets.

The new serial printer takes both friction-feed and pin-feed forms and can print with horizontal pitches of 10-, 12½-, and 16⅔ char./in. It also includes RS-232C or Centronics interface.

The printer is priced at $900 in 500 to 999 OEM quantities and is available from the vendor at Burroughs Place, Detroit, Mich. 48232.

Florida Data Corp.

CHICAGO — A line of high-speed matrix printers for word processing, data processing and communications applications will be unveiled at Florida Data Corp.'s Booths 3108, 3109, 3110 and 3111.

The Models OSP/120 and OSP/130 are said to "fill line printing requirements in the 300- to 600 line/min range," provide graphics, multifont storage, fully formed characters, OCR printing and labeling, according to the vendor.

The printers reportedly have a 600 char./sec print rate for draft or DP output and up to 150 char./sec print rate for letter-quality output. Electronic fonts are stored either in read-only memory or down-line loaded into random-access memory, eliminating the need to change print wheels, print ball or bands.

The OSP/120 costs $3,900 and the OSP/130 costs $4,100 from the firm at 600D John Rodes Blvd., Melbourne, Fla. 32935.

Eastman Kodak Co.

CHICAGO — Eastman Kodak Co., in Booth 807, will be demonstrating its IMT-150 microimage terminal, Komstar 200 microimage processor and Recordak Reliant 750 microfilm recorder.

The IMT-150 terminal employs a microcomputer-based control system for memory, control and diagnostic logic. Used as an alternative to magnetic storage, the terminal is reportedly capable of holding large volumes of digitized documents. A single microfilm magazine will store the images of more than 10,000 letter-size documents, a spokesman said.

Also, when used with a computer in a distributed information network, the terminal is said to relieve the mainframe of many control functions required by the older computer-assisted retrieval systems.

Laser Imaging

The Komstar processor is a plug-compatible, on-line, computer output microfilmer that uses a laser imaging system to print computer data onto dry, heat-processed microfilm, the company said. The unit employs several recent software enhancements, including expanded coding and indexing capabilities on 16mm roll microfilm.

The Komstar is designed to operate with IBM 370 and 360 computers running under OS or DOS, the spokesman stated.

Finally, the Reliant 750 microfilmer can process more than 700 check-size documents or more than 2,200 inches of document material per minute.

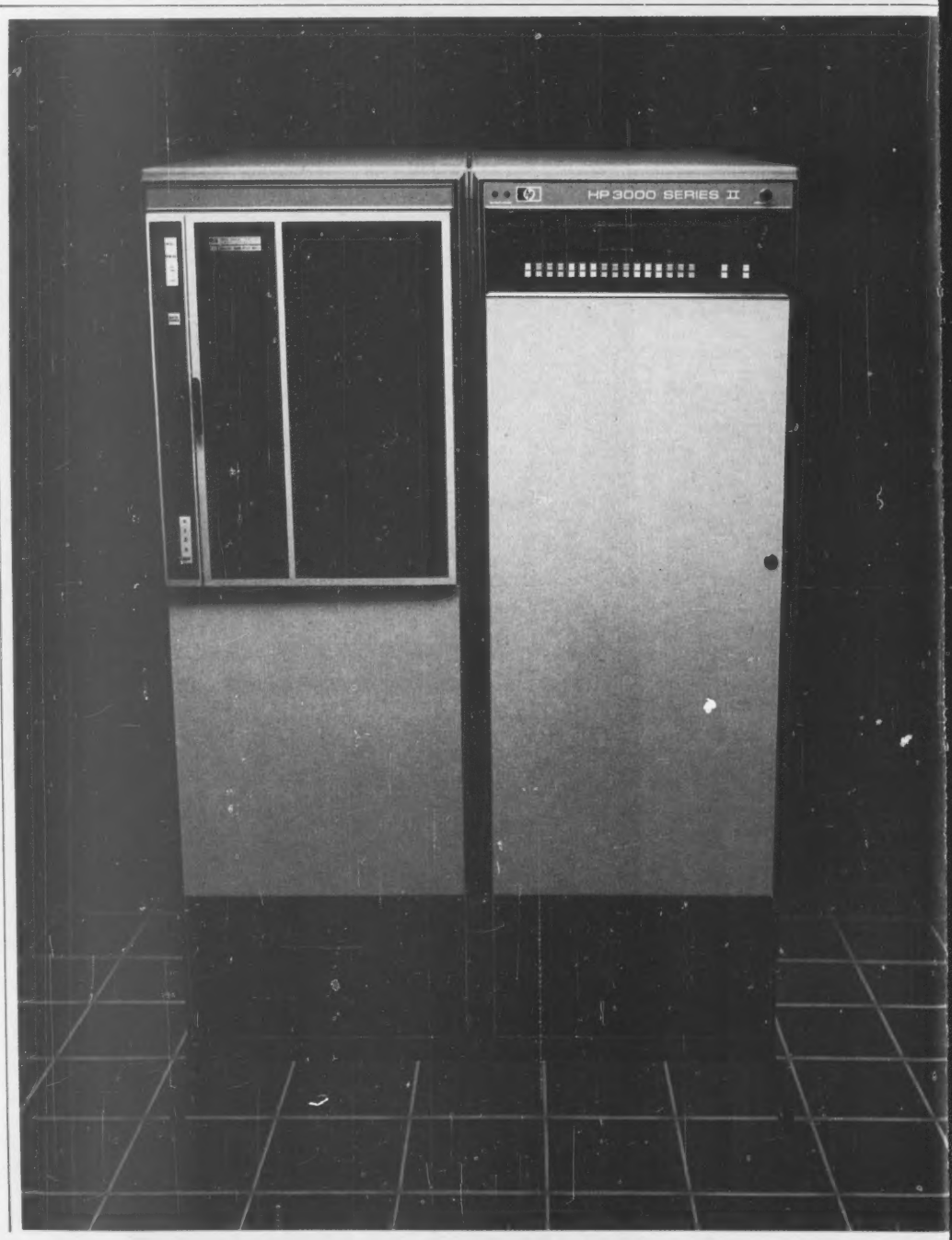
Kodak is located at 343 State St., Rochester, N.Y. 14650.

Okidata Corp.

CHICAGO — Okidata Corp. will show five printers in its Microline and Slimline series including its Model 2350 high-speed serial matrix printer at Booth 1248.

The Model 2350 prints bidirectionally at speeds up to 350 char./sec and features two-color printing and program controlled font selection, the company said.

With delivery in October, the Model 2350 is priced about $1,500 from Okidata Corp., 111 Gaither Drive, Mt. Laurel, N.J. 08054.



Peripherals at NCC

Teac Corp. of America

CHICAGO — Teac Corp. of America will display several new floppy disk drives and digital cassette tape transports at Booth 1084.

The FD-50B is a 48 track/in., 40 track/side, single/double density, double-sided floppy disk drive. Also on display will be the FD-50F, a 96 track/in., 80 track/side single/double density, double-sided drive.

The MT-2-23 and the MT-2-24, which are both two-track, 15 in./sec, 16,000 bit/in. digital cassette tape transports, will be introduced at this time.

The FD-50B is priced at $290 each for quantities of 500. The FD-50F costs $370 in quantities of 500. The MT-2-23 is available in quantities of 100 for $340 each. The price for the MT-2-24 in quantities of 100 is $435 each.

Teac is at 7733 Telegraph Road, Montebello, Calif. 90640.

Ampex Corp.

CHICAGO — The Memory Products Division of Ampex Corp. will be introducing several new products in Booth 901.

The Capricorn series will be announced, which is a line of 14-in. rack-mountable Winchester disk drives. It consists of the Model 165 with a capacity of 165.9M bytes and the Model 330 with a capacity of 330.3M bytes. These are priced at $5900 and $7100 respectively in OEM quantities, and are format- and interface-compatible with Ampex's DM900 and DM9000 series of removable media disk drives.

The Ampex Megastore 500 also will be on display, which will upgrade and improve performance for Raytheon computer users. Utilizing a microprogrammed controller and random-access memory, the Megastore 500 operates via the DIO and DMA bus. It is priced at $17,650 for 1M byte with OEM discounts. Storage capacities up to 4M bytes are available.

The Constellation Series will also be making its debut, and it offers two emulating storage module disk controllers for Digital Equipment Corp. and Data General Corp. systems. The Model ADC-11 provides full emulation of DEC's RM02/3, RM04/5 or RK06/7 subsystems as well as media compatibility between Ampex SMD disk drives and the corresponding DEC drives. The Model ADC-10 provides the same for the DG DG6067 subsystems. The ADC-10 is priced at $3400 in OEM quantities and the ADC-11 costs $4000.

Ampex can be reached at 401 Broadway, Redwood City, Calif., 94063.

Continental Resources, Inc.

CHICAGO — Continental Resources, Inc. (Booths 304, 305 and 306) will show its line of printers, graphic terminals, terminals, modems and supplies from manufacturers including Digital Equipment Corp., Texas Instruments, Inc. and Diablo Systems, Inc.

Continental offers rental, leasing or purchase options along with service agreements for used computer peripheral equipment.

The firm is located at 175 Middlesex Tnpk., Bedford, Mass. 01730.

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WHAT'S UP?

UP is United Peripherals. And United Peripherals is a company that specializes in putting together the industry's finest disk subsystems with some of the industry's finest minicomputers. If you're an HP 3000 user looking to up your capacity in less space, to up your cost efficiency with fewer hassles and to up your uptime with fewer spindles, UP is your next logical step.

HP MAKES TERRIFIC COMPUTERS, BUT...

Let's face it, their disk drives have not been trendsetters. Just look at the record. In 1974, when HP was introducing its 3000 computer, a firm named IBM was announcing a drive technology they called Winchester. To this day, that technology has stood as the standard in drive design, performance and reliability. And to this day, HP has yet to offer to its 3000 users a Winchester drive. And since they introduce new drives about every two years, it is not for lack of opportunities.

A PREMATURE ANNOUNCEMENT OF HP'S LATEST DINOSAUR.

Recently, HP has been telling its 3000 users to hang on, to wait just a little longer for its new 400-mb drive. Rumored for introduction this year, when it does arrive, this one won't feature Winchester technology either. Well, maybe next time. And if you are wondering what HP intends to do with the drives the new one obsoletes, you're not alone. Or maybe you are.

MOVE UP. A SMART MOVE FOR NOW. AND FOR THE FUTURE.

Put aside HP's underwhelming strides in disk drive technology, their less-than-spectacular history of drive model longevity, the question marks of when their new 400-mb model will be here and what will happen to the once-again obsoleted ones that the new model is meant to replace. Consider instead the UP1696 disk drive subsystem. Defined by CDC's 600-mb Model 9775 with state-of-the-art Winchester design, and Microcomputer System's 1696 controller, the UP1696 is a better product in every way. Compared with what HP says is coming, the 1696 delivers more capacity and is based on a superior technology. Compared with HP's current 7925, the UP1696 delivers four times the capacity—and more uptime—in the same space, with dollars-per-megabyte savings of up to 40% and floor space savings of up to 75%.

A DEAL TO APPRECIATE. AND DEPRECIATE, TOO.

Here's the deal. We'll put a UP1696 subsystem on your floor and buy back up to three of the four 7925s it effectively replaces. And for each UP1696 add-on purchased, we'll buy back two more 7925s. Such generosity has its limits, so order soon. Besides, the sooner you see the UP1696 in action, the sooner you'll appreciate its performance. And, as far as Uncle Sam is concerned, the sooner you'll start depreciating it as well.

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Peripherals at NCC

3M Co.

CHICAGO — 3M Co. will be showing its HCD-75 data cartridge system at Booth 837.

The unit features a 4- by 6-in. data cartridge that provides 67M bytes of storage capability. The unit is suited for disk backup, program distribution, data interchange, journal or archival applications and it costs $2,800, 3M said from 3M Center, St. Paul, Minn. 55101.

Data Switch Corp.

CHICAGO — Data Switch Corp. will be exhibiting several new products in Booths 135-138.

The System 1030 Automated Switch Control (ASC) is a solid-state integrated microprocessor control for the Data Switch System 1000. This product allows user definition, selection and control of up to 64 switch configurations.

The unit provides rapid error-free configuration of a switch system based on a preprogrammed input, almost totally eliminating any operator decision making for a computer configuration, according to the vendor.

Program Review

Prior to Execute commands, the System 1030 ASC allows selected program preview. There is a full console panel for display of current or stored configurations, and a keylock switch is provided for security to prevent unauthorized switch transfer. The price range for such a system is $7,000 to $15,000.

The Data Switch System 2880 EIA Matrix Switch features integrated test access and monitor functions plus diagnostic display. It is available in sizes ranging from a 4 by 4 to any desired matrix size in increments of 4.

The vendor claims that this matrix design obviates the need for any EIA patch panels, and it allows the user to electronically connect a modem to any available FEP port cabled to the System 2880. These units are priced at $8,000.

Also on display will be a new enhancement to the Data Switch line, the System 2300 EIA Cross-Over Switch. This will provide the capability of interchanging two modems and two FEP ports.

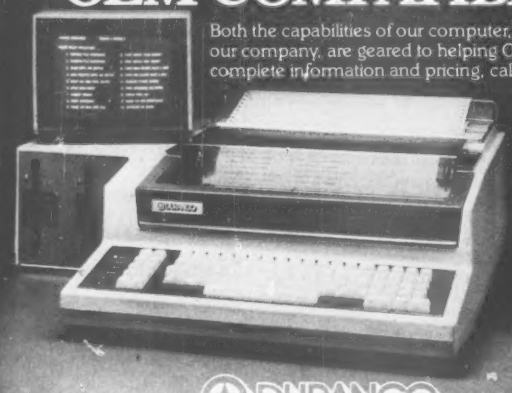
It is totally modular in design, with up to 16 switch modules comprising a fully expanded system, enabling easy field expansion and "on-line" maintenance with simple PCB card replacement, according to the vendor.

These systems range in price from $2,000 to $8,000.

Data Switch Corp is located in Landmark Square, Norwalk, Conn. 08651.

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WE'RE OEM COMPATIBLE.

Mag-Tek, Inc.

CHICAGO — Mag-Tek Inc., in Booths 1526 and 1527, will be exhibiting its MT-50 Card Encoder and MT-6400 Hospital Admitting System.

The card encoder is specifically designed for on-site encoding of magnetic stripe cards, for such things as inventory control cards, access control cards and identification badges. They are now priced at $5,500 for numeric cards and $8,500 for the alphanumeric kind.

The hospital admitting system utilizes a high-density reader/writer to encode patient information on magnetic stripe cards. The card can hold up to 640 characters of information, as compared to a standard credit card of 226 characters. The vendor reports an admission-time savings of 30% with this system.

The MT-6400 can operate alone or can be put on-line to a host computer. The reader/writer unit is priced at $4,400, and is available now. More information can be obtained from Mag-Tek headquarters at 20725 S. Annalee Ave., Carson, Calif. 90746.

DATA REDUCTION OPERATORS TO STAR IN LOCKHEED PRODUCTIONS

At Lockheed Company in Burbank we are involved in some of the largest productions of the 80's, and we need the best talent available. Right now we seek Data Reduction Operators to provide hard copy for analysis/reports in a timely manner, by utilizing and operating digital computers and/or specialized analog and digital electronic data systems in a data reduction laboratory.

This position requires a strong working knowledge of large and small scale computer systems/peripherals as well as special data systems such as FM demodulators, PCM decommutators, recording systems and A/D converters. You will diagnose and trouble-shoot problems (hardware/software) as required. HP 1000 series experience desirable. The position requires odd shifts and/or overtime. Some programming experience helpful.

Qualified candidates are requested to send resume to Louise Nagata (BB) Lockheed recruitment Office, P.O. Box 551, Burbank, CA 91520, or call toll free (800) 421-9533, in California (800) 252-7525 anytime. Our employment line is always open. An equal opportunity F/M/H/V employer. U.S. citizenship required.

Lockheed-California Company
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Rusco Electronic Systems

CHICAGO — Rusco Electronic Systems (RES) will show its English-text printer at Booths 150 and 151.

The System Activity Logger (SAL) 510 also provides hard-copy event recording in French, German and Italian text, the firm said.

Designed for access control security systems monitoring, the SAL 510 records system access events and generates alarm and action messages when warranted.

The printer is specifically set up to interface with RES Model 530 and 540 Micro Access Controllers (MAC) that collect the data required to ensure equipment, information and personnel security, a spokesman explained.

Base price for the SAL 510 is $3,990, RES said from its headquarters at 1840 Victory Blvd., Glendale, Calif. 91201.

General Terminal Corp.

CHICAGO — General Terminal Corp. will introduce the GT-100D terminal at Booth 4716.

A low-cost, plug-in replacement for the Data General Corp. Dasher 6053, the terminal features a Z80 microprocessor, 12-in. raster screen display, 96 Ascii characters, 14-key numeric cluster and 32-line drawing character set, General Terminal said.

Its capabilities include line graphics, programmable function keys, smooth scroll and a user-settable clock — features not found on the Dasher, the vendor spokesman said.

Optional Features

Optional features include a detached keyboard, composite video output and printer interface, the vendor spokesman added.

General Terminal is located at 14831 Franklin Ave., Tustin, Calif. 92680.

Peripherals at NCC

C. Itoh Electronics, Inc.



CHICAGO — C. Itoh Electronics, Inc. will be displaying its Starwriter family of daisywheel printers and other products at Booth 645.

Included will be the company's new 40 char./sec printer, which uses the industry-standard RS-232C EIA communications interface. It features a 96-char. print wheel and a format that accommodates multilingual applications, according to the vendor.

The printer also produces letter-quality printing with either 136 columns in pica pitch or 163 columns in elite pitch, the vendor said.

C. Itoh also will be exhibiting its Comet 80-column dot matrix printer, Comet II 136-column matrix printer, Starwriter 25 char./sec daisywheel printer and its Starwriter II 45-char./sec daisywheel printer.

The company's CIT 101 video terminal, Maxi-Flexi 8-in. floppy disk drive and Mini-Flexi 5-1/4-in. floppy disk drive will be included in the display, as well as its Model 200 Series of dot-matrix impact printers, Model 500 Series of dot-matrix impact printers and CRT display monitors.

The daisywheel printer with serial interface is priced at $2,508 with quantity discounts available, the vendor said from 5301 Beethoven St., Los Angeles, Calif. 90066.

Integral Data Systems, Inc.

CHICAGO — Integral Data Systems, Inc. will exhibit its Paper Tiger family of printers including the prototype of a low-cost, very high-density overlapping dot matrix printer in Booths 1732, 1733, 1734 and 1735.

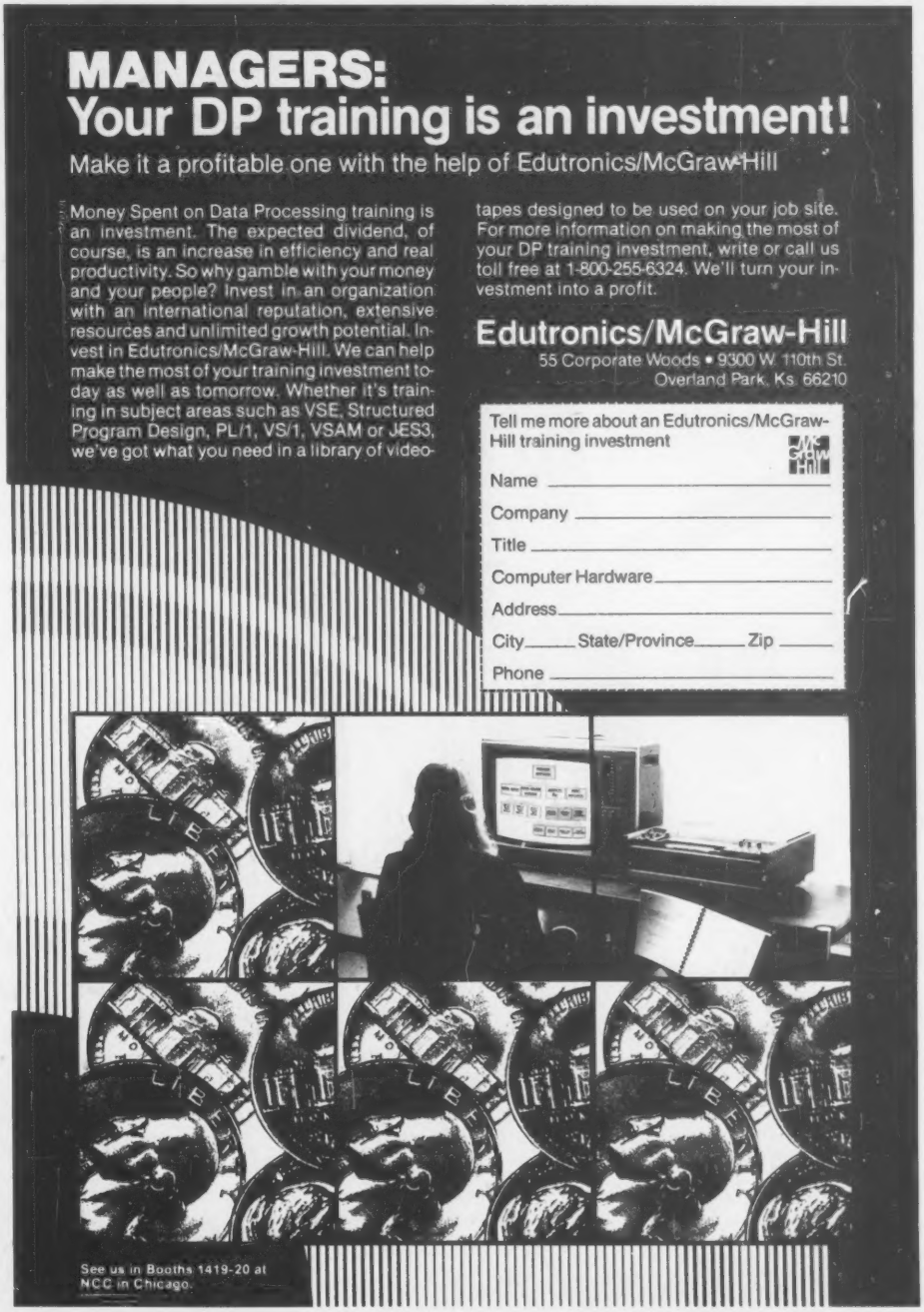
The Paper Tiger lineup includes the Model 560, 460 and 80-col Paper Tiger 445. The Model 560 is a 132-col overlapping dot matrix printer aimed at computer systems OEMs and system houses for business and other applications. The 560 prints text or graphics bidirectionally at up to 150 char./sec and costs $1,695.

The 80-column Model 460 is a 9-wire overlapping dot matrix printer aimed at the business microcomputing OEM market. The 445 is a 7-wire matrix impact printer with optional Dotplot graphics, designed for providing reportedly low-cost hard copy from 80-col CRT terminals.

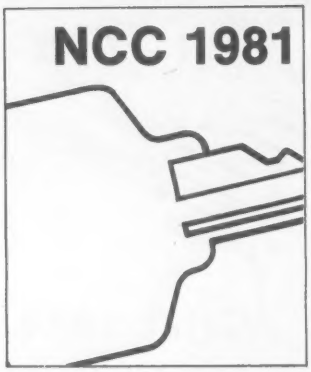
The printer addition will also be a 132-col machine and reportedly will offer ultra-high-density, overlapping dot matrix text and graphics printing for multifunction workstation application requirements.

Integral Data Systems, Inc. is located in Milford, N.H. 03055.





Peripherals at NCC



Data Specialties, Inc.

CHICAGO — Data Specialties, Inc. is introducing a line of punch tape readers which reportedly are designed to solve problems such as LED failure and cross-talk. This will be in Booths 401-402.

To eliminate the problem of LED failure, Data Specialties uses LEDs that have been burned in for 168 hours, simultaneously assuring stabilized voltage levels, the vendor said.

To eliminate cross-talk, the LED array has been masked, using holes which direct each LED beam to its particular photosensor.

The line includes the R-30 with a speed of 30 char./sec, the R-150 for 150 char./sec applications and the R-300, rated at 300 char./sec. They each feature a solid-state LED light source, wide opening read heads, self-cleaning tape heads, stepper motor drives and the ability to read all types and widths of tapes.

The Model R-150 is plug-compatible with Addmaster Corp. equipment and the R-300 is plug-compatible with the Decitek Model 262, according to Data Specialties.

List prices range from $200 to $345, including a six-month warranty for parts and labor, from the company at 3455 Commercial Ave., Northbrook, Ill. 60062.

Ontrax Corp.

CHICAGO — Ontrax Corp. will feature three products within its Series 8 family at Booth 5626.

Its Series 8 disk drives feature unformatted capacities of 68M- and 136M bytes and each model contains two read/write head positioners to maximize throughput. OEM quantity pricing for the Model 136 is approximately $5,000 including power supply; deliveries are scheduled to begin in the first quarter of 1982.

The Data Management Subsystems are designed for a variety of applications and control backup devices such as tape and floppy disks as well as the Series 8 disk drives, Ontrax said. Product availability is reportedly set for the first quarter of 1982, with OEM pricing of $6,200 with a 136M-byte drive.

The firm also offers the data management electronics (DME) employed within Series 8 subsystems as a stand-alone product. Scheduled for third-quarter availability this year, OEM prices for a minimum configuration are $2,200.

Ontrax is at 611 Vaqueros Ave., Sunnyvale, Calif. 94086.

Kennedy Co.

CHICAGO — Kennedy Co. will show its high-density 80M-byte 14-in. Winchester disk drive, Model 5830, at Booth 1007.

The unit will be demonstrated for the first time. Features include a 6,330 bit/in. recording density with a 429-track/in. density, the vendor said.

The unit operates as a stand-alone drive using a Control Data Corp. controller, or it can be linked in a daisy chain fashion with a CDC SMD or mini-module drive, according to the vendor.

The unit costs $4,320, the vendor said from 1600 Shamrock Ave., Monrovia, Calif. 91016.

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Minis at NCC

Four-Phase Systems, Inc.

CHICAGO — Four-Phase Systems, Inc. will feature its recently introduced System 311 batch processor and Model IV/80 multifunction system at Booth 750.

Designed to allow users of Four-Phase distributed processing systems to off-load batch applications from IBM mainframe hosts to remote sites, the Model 311 32-bit processor offers compatibility with the IBM 370 instruction set and I/O channel interface.

Said to be comparable to the IBM 4331 Group 1 machine, the price range for the 311 may be "significantly lower" than that of its counterpart, depending on the hardware configuration, according to a Four-Phase spokesman.

Utilizing bus architecture, it is capable of data transfer rates up to 16M byte/sec and can execute nonmemory-dependent microsteps concurrent with I/O transfers, he said. Minimum memory configuration is 512K bytes and it can be expanded in 1M-byte increments to 4M bytes. Available immediately, a sample configuration would cost less than $3,000/mo, based on a 42-month lease.

The System IV/80 is intended for large-volume multifunction distributed data processing (DDP) environments, the vendor explained.

Providing a communications interface for one or more lines operating up to 9,600 bit/sec, the system supports bisynchronous, asynchronous and Synchronous Data Link Control (SDLC) protocols. It supports up to 480K bytes of main memory and a maximum of 32 Four-Phase terminals. Disk storage capacities range from 5M bytes to 270M bytes.

A typical IV/80 configuration including 480K bytes of memory, 40M bytes of disk storage, 10 terminals, one communication line and three printers costs less than $3,000/mo, based on a 42-mo lease.

The display will also include three Four-Phase software products. First is the Foreword shared word processing (WP) system designed to provide documentation-oriented WP and electronic distribution.

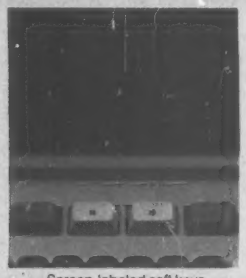
A transaction-oriented distributed processing system that combines source data entry, on-line inquiry and retrieval, stand-alone processing and batch communications will be the second software product on exhibit. Vision software multifunction executive support allows concurrent operation of Vision with Cobol and Foreword WP, the vendor noted.

Third will be the firm's Office Management System/IV, an office automation system designed to provide administrative support at an organization's executive and managerial levels. It integrates WP, DP and network communication for office automation, Four-Phase said.

The firm is located at 10700 N. DeAnza Blvd., Cupertino, Calif. 95014.



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Data General Corp.

CHICAGO — At Booth 826, Data General Corp.'s Information Systems Division (ISD) will exhibit an Eclipse MV/8000 system with 13 Dasher alphanumeric and graphics display terminals and demonstrate its newest range of 32-bit end-user, program development and communications software.

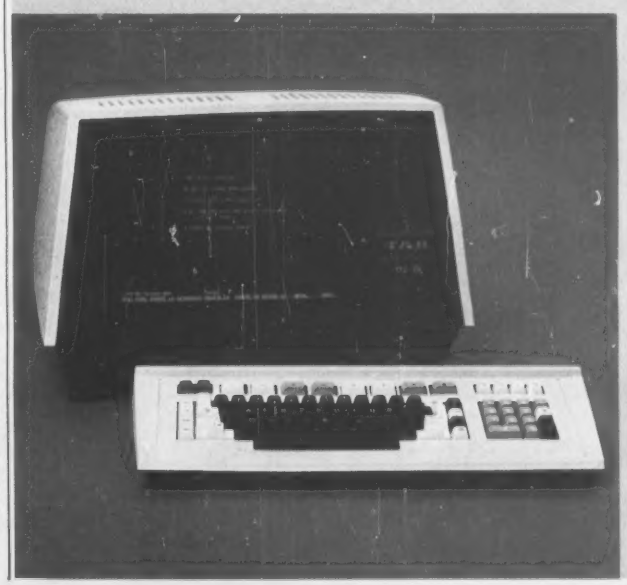
The software products will run under DG's Advanced Operating System/Virtual Storage (AOS/VS) on the MV/8000. The MV/8000 will also demonstrate new Trendview graphics display software which reportedly enables users in both business and technical environments to create bar, pie or line charts.

AZ-Text software which adds word processing capabilities to all Eclipse systems will be exhibited with a letter-quality printer. In addition, a range of commercial and scientific programming subsystems will be demonstrated, from Ansi '74 Cobol to PL/I to DG's Proxi program generator.

The MV/8000 is priced between $150,000 and $204,000, depending upon the amount of memory and number of disks. The new Trendview chart generator software is priced at $3,000, DG said from Rt. 9, Westboro, Mass. 01581.

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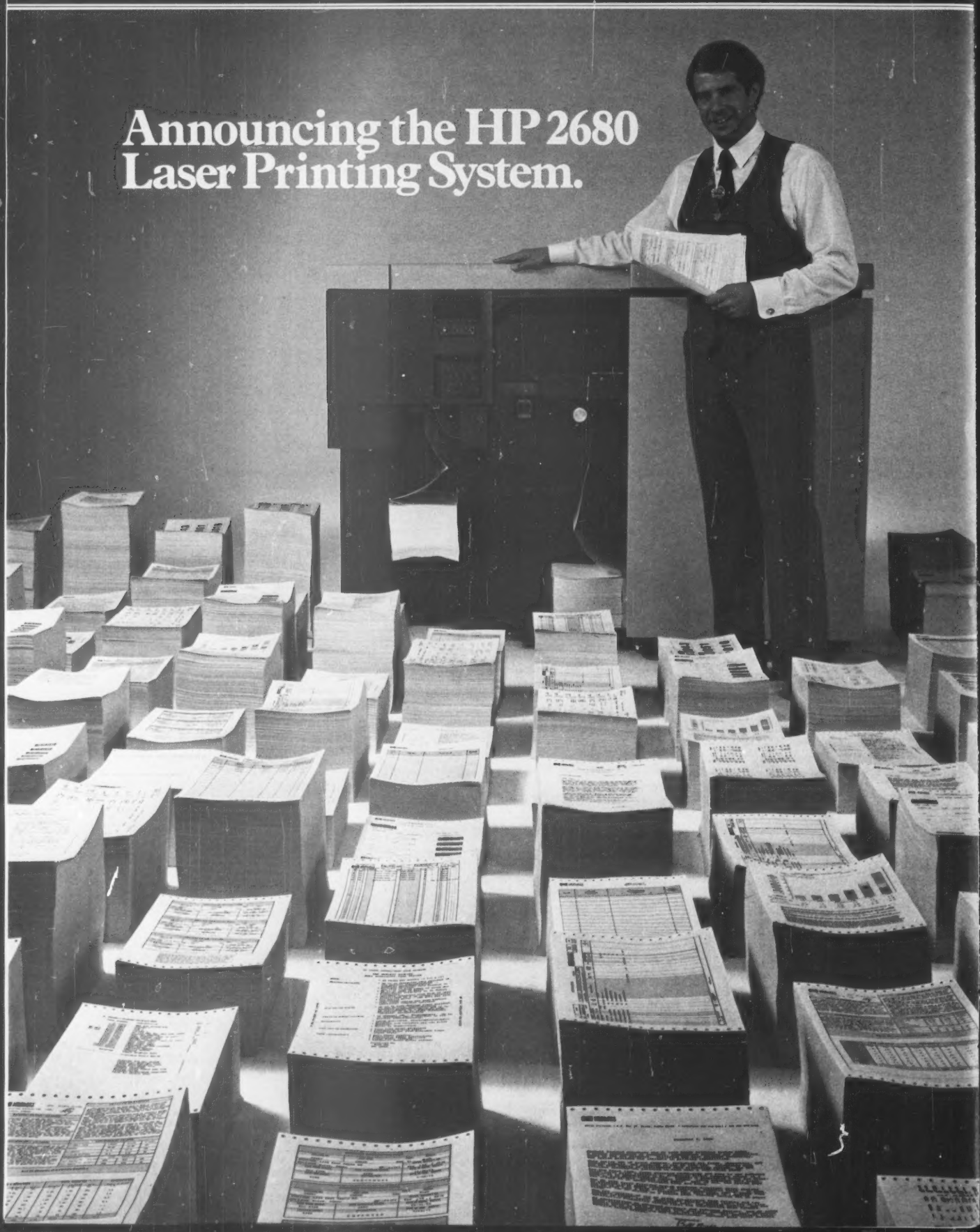
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Minis at NCC

Prime Computer, Inc.

CHICAGO — Prime Computer, Inc. will introduce a new high-end computer system designed for multiuser environments, as well as demonstrate a number of its other offerings, at Booth 841.

The Model 850 is a virtual memory minicomputer that implements multiple instruction stream processing, reportedly resulting in at least 50% more throughput than current supermini systems. The system can support up to 128 directly connected terminals.

The system is said to be the first computer to feature one-million-byte memory boards using 64K-byte MOS random-access memory chips. The National Computer Conference configuration will include one CPU with 2M bytes of main memory, one 300M-byte disk drive, one tape drive, two 300 line/min printers, five office automation workstations, a variety of software products, Primenet networking, Command Procedure language and other user support packages. A typical 850 system costs $525,000.

Also exhibited will be two computers from the firm's 50 series. Called the Mod-II systems, the 250-II and 550-II will be configured with one CPU each, 512K bytes of main memory, 32M-byte disk storage, assorted software and languages. The systems range from $86,000 to $190,000.

Prime is located in Prime Park, Natick, Mass. 01760.

Harris Corp.

CHICAGO — Harris Corp. Computer Systems Division will debut a high-performance supermini and a data communications information processing system at Booth 601.

The H300 minicomputer is a 48-bit machine that features up to 2M bytes of real memory and up to 12M bytes of virtual memory. Targeted for scientific, educational and technical applications, the computer can handle up to 48 interactive users and has a multiple language capability, a spokesman said.

The Model 9220 information processing system, the newest addition in the firm's 9200 series of IBM 3270-compatible machines, is capable of concurrent multihost communications in either of IBM's SNA/SDLC or BSC protocols or both. The Harris 9200 series was introduced at last year's National Computer Conference.

Using its multihost capability, the 9220 has local area network support (Lans) via a fiber-optic channel attachment to IBM host systems. Lans is a Harris product that extends the high-speed local attachment at sites with widely dispersed facilities or large buildings, the spokesman explained.

In addition, the company will unveil an optional scientific arithmetic unit and a number of peripheral storage and output devices for the 9200.

Also at the show, the firm's Data Communications Division will introduce an interactive Cobol language capability for its 1600 distributed data processing system. The interactive language is designed to be compatible with the standards prescribed in Ansi X3.23 1974 at the low-to-intermediate level as defined by Federal Information Processing Standard (Fips) 21-1.

The Cobol language is geared to run in the firm's multifunction display station and includes an interactive screen definition program that defines and implements screen formats for source entry applications.

Harris Data Communications and Computer Systems Divisions are headquartered in Dallas and Fort Lauderdale, Fla., respectively. However, information about the systems can be obtained from the firm's Information Systems Group in Melbourne, Fla. 32919.

Wintek Corp.

CHICAGO — A single-board computer with analog, serial and power control I/O will be displayed by Wintek Corp. at Booth 1280.

The 4.5-in. by 6.5-in. module can be configured with eight analog inputs, one analog output, serial I/O and any mix of eight ac or dc inputs or outputs, the company said.

The module is priced from $88 to $295 depending on quantity and options from Wintek Corp., 1801 South St., Lafayette, Ind. 47904.

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A relational data base is a collection of data items represented logically as two dimensional tables. Files use logical fields within records as their only required linking mechanism. Users need not be concerned about details of structure, only about the logical relationships which exist between files. This simplicity and the ease of use inherent to relational data bases has been obscured historically by attempts of vendors to shoehorn or add on relational structure to a conventional operating system. The results are laboratory curiosities, interesting but cumbersome, and they give relational models an undeserved reputation for poor performance.

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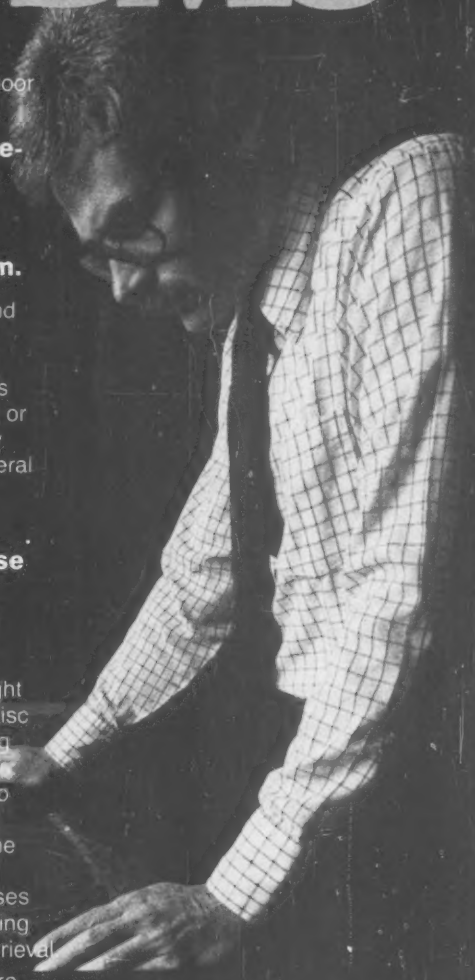
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Minis at NCC

BBN Computer Corp.

CHICAGO — BBN Computer Corp. and BBN Information Management Corp. will be in Booth 4500 to show their line of office automation hardware including the C Machine, a microprogrammable minicomputer designed around the C programming language, and the Infomail electronic mail system.

The C Machine was designed around Bell Laboratories' Unix time-sharing operating system. It is a programmable 20-bit processor with 32-bit microwords. Processor components include an 8K- by 32-bit memory a 1K- by 20-bit register scratch pad.

Infomail is an electronic mail software package that runs on a variety of processors, the firms said from 33 and 68 Moulton St., Cambridge, Mass. 02238.

Qantel Corp.

CHICAGO — Qantel Corp., now part of MDS Qantel, Inc., will present its new Series 350 line of minicomputers, including the top-of-the-line System 355, at Booth 1256.

The company will also announce a communications system featuring the System 355 and the Mohawk Data Sciences, Inc. Series 21 distributed data processing system.

The System 355 features up to 1M byte of main memory plus up to 1.2G bytes of disk storage, multiple printers and 60 or more CRT workstations, the company said.

Also featured at the Qantel booth will be the Trivex data entry terminal, an IBM 3270-compatible device.

Price of the System 355 begins at $60,000 with delivery in 90 days, the company said from its headquarters at 4142 Point Eden Way, Hayward, Calif. 94545.

Archives, Inc.

CHICAGO — Archives, Inc. will show three models of desktop business microcomputers at Booth 5514.

Archives I is a Z80A-based S-100 bus unit operating under CP/M, with 64K random-access memory, dual disk drives and 372K byte/disk.

With a 12-in. CRT, the unit has a 104-key detachable keyboard featuring 20 function keys for word processing commands.

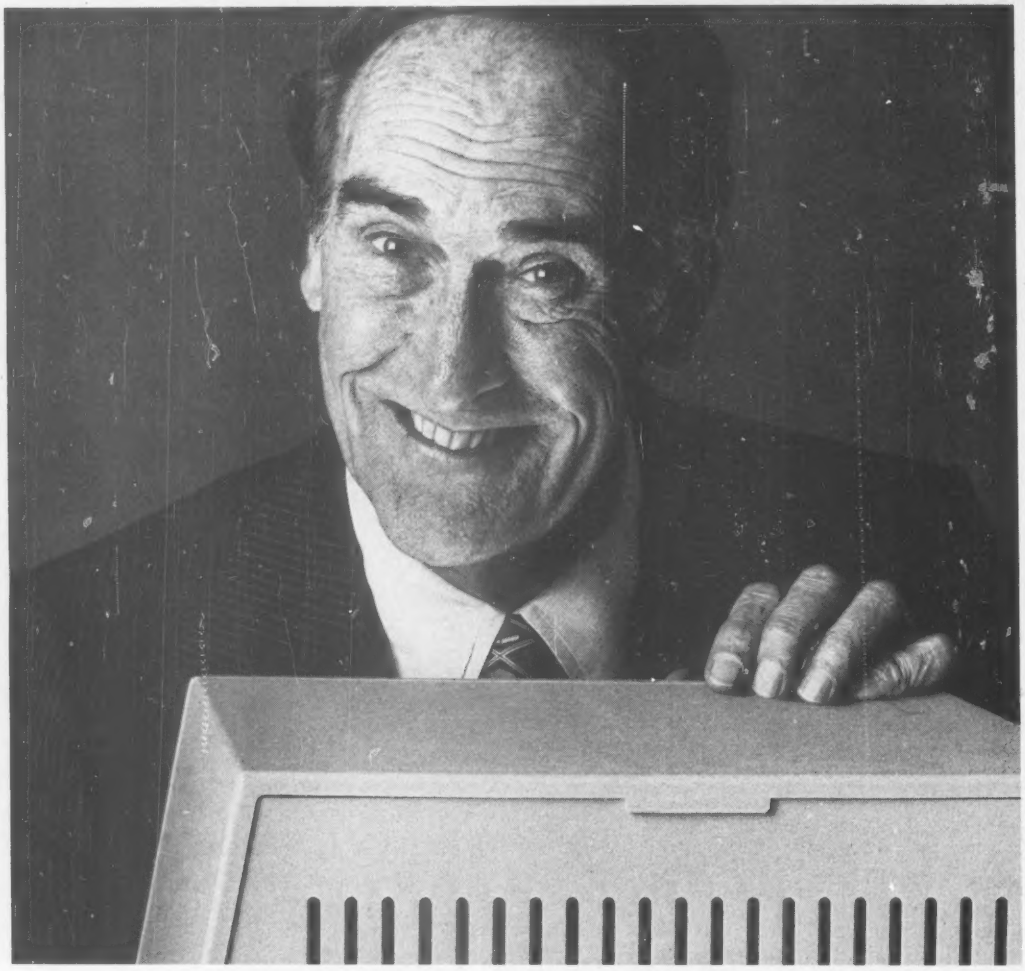
The Archives offers word processing software, data processing and communications, as well as software to interface with the Westlaw Legal Research data base, the vendor claimed.

Archives II

Archives II is the same as Archives I, except that the utilization of dual double-sided floppy disk drives provides 750K byte/disk drive, with 1.5M bytes total storage, Archives said.

Finally, Archives III — also with the same specifications as Archives I — differs in that it utilizes one 5M-byte Winchester drive and one double-sided floppy disk drive, with 5.75M bytes total storage.

Archives, Inc. is located at 404 W. 35 St., Davenport, Iowa 52806.



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Minis at NCC

Microdata Corp.



CHICAGO — Microdata Corp., at Booth 852, will be showcasing a number of its products, including the Sovereign data processing system and its Reality series of data base management systems.

Sovereign recently debuted in the U.S. and consists of a number of system processors that link together to form a business processing network. The Sovereign processing terminal is actually a bipolar, microcoded minicomputer with a minimum of 32K bytes of memory. It provides high-speed interactive communications between the system and the user.

The file processor, the traffic cop of the system, controls magnetic tape and disk storage. It also has a minimum of 32K bytes of memory. The Sovereign keystation terminal is used for data entry applications and can perform write, verify, search and other administrative functions, a spokesman reported. The keystations are controlled by keystation processors that can handle up to eight terminals each.

A Sovereign system can support up to four keystation processors and, therefore, up to 32 keystation terminals.

The Reality family of small business computers includes the models 2000, 4000, 6000 and 8000. The systems are designed to provide multiple users with update and information retrieval capabilities.

The systems can be configured to provide from 32K- to 512K bytes of main memory, up to 514M bytes of disk storage and up to 32 operator terminals, the spokesman noted. A typical system contains a CPU, disk drive, reel-to-reel magnetic tape, Prism CRT terminal and printer.

The systems are designed to communicate with the user in English, a user-friendly language, and can be programmed in Microdata's Data/Basic.

Microdata is headquartered at 17481 Red Hill Ave., P.O. Box 19501, Irvine, Calif. 92713.

Nixdorf Computer Corp.

CHICAGO — Nixdorf Computer Corp. will be demonstrating in Booth 856 the link that reportedly provides interactive communications between the Nixdorf 8840 word processing system and the Nixdorf 600/55 distributed data processing system.

The company will demonstrate special applications on the 8870 including mortgage closing, construction contractor management and insurance agency management.

Nixdorf is based at 168 Middlesex Tnpk., Burlington, Mass. 01803.

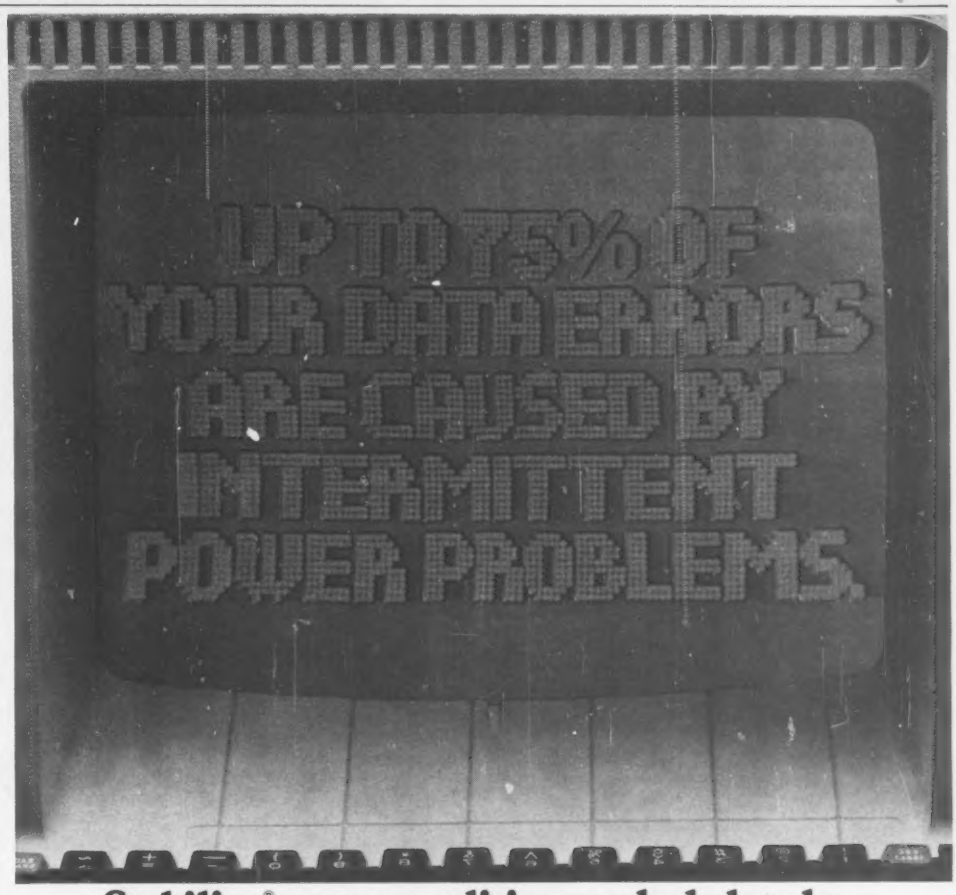
Panasonic Co.

CHICAGO — Panasonic Co. will be offering a one-touch key-mat along with several other products.

The man-machine interface is approximately the size of a standard keyboard. It consists of one switch panel and one removable cartridge mechanism. The switch panel features 96 variable keys, 24 page-select keys, 12 function keys and 48 fixed indicators with status lights.

With 96 customized legends per page and 24 pages per cartridge, the man-machine interface has 2,304 legends for each cartridge.

When employing the maximum 15 interchangeable cartridges, the unit makes 34,560 legends available. Thus, any page is accessible to the operator in less than a second, the vendor claimed. The OEM price ranges from $1,500 to $2,500, the vendor said from One Panasonic Way, Seacaucus, N.J. 07094.



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Call Richard Pettey 203-582-9561 or write The Superior Electric Company, Bristol, CT 06010 today for a FREE problem power troubleshooting manual and complete product information.



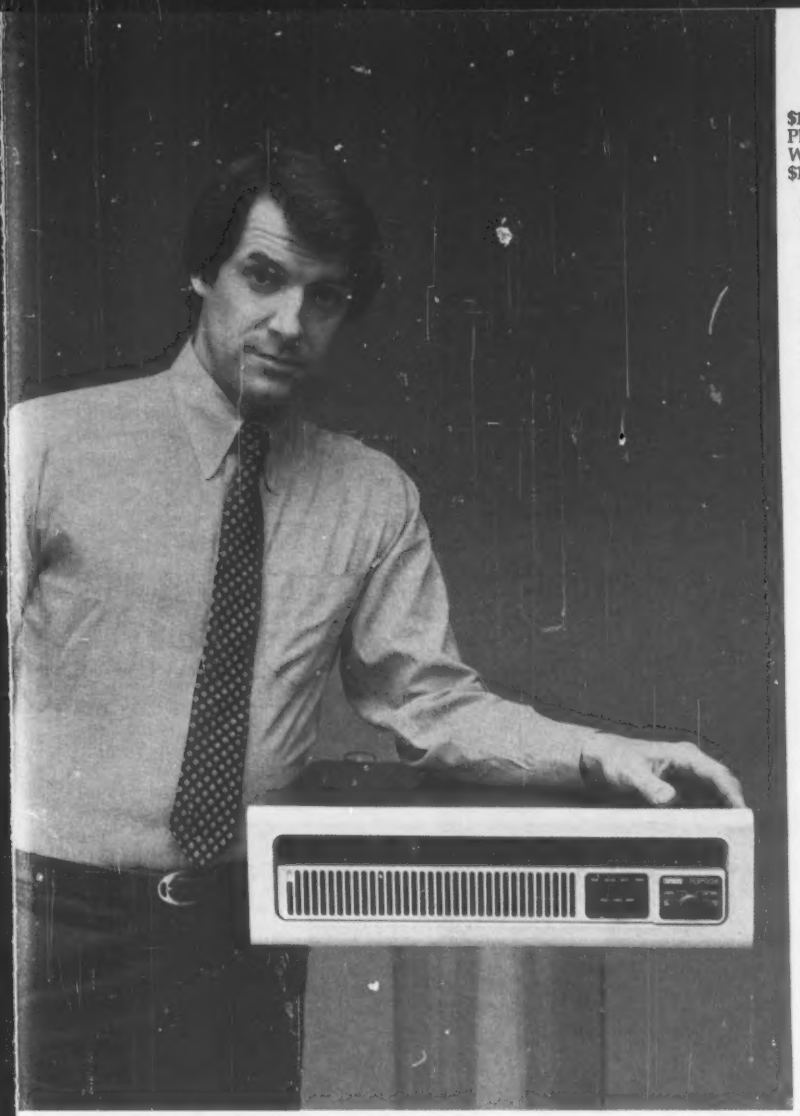
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$11,000*
PDP-11/24 CPU with 128 KB memory in a 5¼" box. With 256 KB, $13,000.* A 10½" box with 256 KB, $15,000.*

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The extensive capabilities of the PDP-11/24 allow a wide range of systems configurations. No matter what your applications needs, you can tailor a PDP-11/24 box or system with great flexibility and low cost. The examples shown here only begin to indicate the enormous growth potential of the PDP-11/24. Beyond that you have the full range of UNIBUS options, peripherals, and PDP-11 family systems.

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The PDP-11/24. It starts at $11,000. But where you go from there could make history.

For complete information, contact your local Digital representative or **Digital Equipment Corporation,** 129 Parker St., PK3-2/M94, Maynard, MA 01754, Attn: Media Response Manager. In Europe: Digital Equipment Corporation International, 12 Av. des Morgines, CH-1213 Petit-Lancy/Geneva. In Canada: Digital Equipment of Canada, Ltd.

Digital's new PDP-11/24. The custom LSI UNIBUS processor with megabyte memory expansion for real mid-range systems capability

Digital introduces the latest addition to its historic line of PDP-11 minicomputers. The new PDP-11/24. A system with so much power per dollar, it will change your ideas of what to expect from a minicomputer.

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RT-11 based dual RX02 system with 128 KB memory.

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*Prices apply to U.S. only, for single-unit quantity, fully supported systems.

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Minis at NCC

Alpha Micro

CHICAGO — At Booths 1271 through 1274, Alpha Micro will be demonstrating four microcomputer-based business computer systems, one of them featuring an 8-in. Winchester disk drive.

The AM-1011 contains 2.4M bytes of floppy disk storage and 64K bytes of memory; the AM-1031 has a 10M-byte hard disk and from 64K to 1M bytes of memory; and the AM-1051 has a 90K-byte hard disk and up to 1M bytes of main memory. The fourth system, the 8-in. Winchester disk-based computer, features an optional dual-sided, double-density floppy disk and video cassette recorder for system backup.

All of the computers utilize the firm's disk-based operating system (Amos) which offers multiuser capabilities, device independence, multiprogramming and the ability to deliver up to 64K bytes to each user under a memory bank switching arrangment. As a result, up to 24 terminals or printers can reportedly be added to the system with enough memory to handle each user job.

Also in the same show area, Alpha Micro will showcase its recently unveiled 128K-byte memory board that features memory management capabilities; an enhanced version of Alphavue, the firm's word processing software; and electronic mail. The electronic mail will be demonstrated at the booth by representatives who will be sending messages from the Chicago show floor to the company's headquarters on the West Coast.

Alpha Micro is located at 17881 Sky Park North, P.O. Box 18347, Irvine, Calif. 92713.



Digilog Network Control Division

CHICAGO — Digilog Network Control Division, at Booths 1341, 1342 and 1343, will show its line of desktop processors, a mass storage unit and a remote-control switching unit.

The firm will show the System 1000, an entry-level desktop processor in the $4,000 to $6,500 price range. Features include software to perform general business operations and 325K bytes to 1.3M bytes of diskette storage, the vendor said.

Also on display will be the Digilog System 1500, a desktop processor with a 5M-byte Winchester disk drive, and an integrated 700K-byte double-sided double-density hard disk drive, the vendor said.

Digilog will display its data line monitor mass storage subsystem and a turnkey tech control solution. The mass storage unit is a dual floppy disk combination to the Digilog DLM III data line monitor. It expands DLM III applications in unattended monitoring situations and for off-line fault analysis of long data streams.

The turnkey tech control solution is tailored to the needs of smaller growing users. It provides automatic monitors and alarms, network diagnostic facilities, network reconfiguration capabilities and extra cabinet storage for a modem and cables, the vendor said.

The firm will also show its remote-control switching system for data communication networks, the vendor said from Babylon Road, Horsham, Pa. 19044.

Point 4 Data Corp.

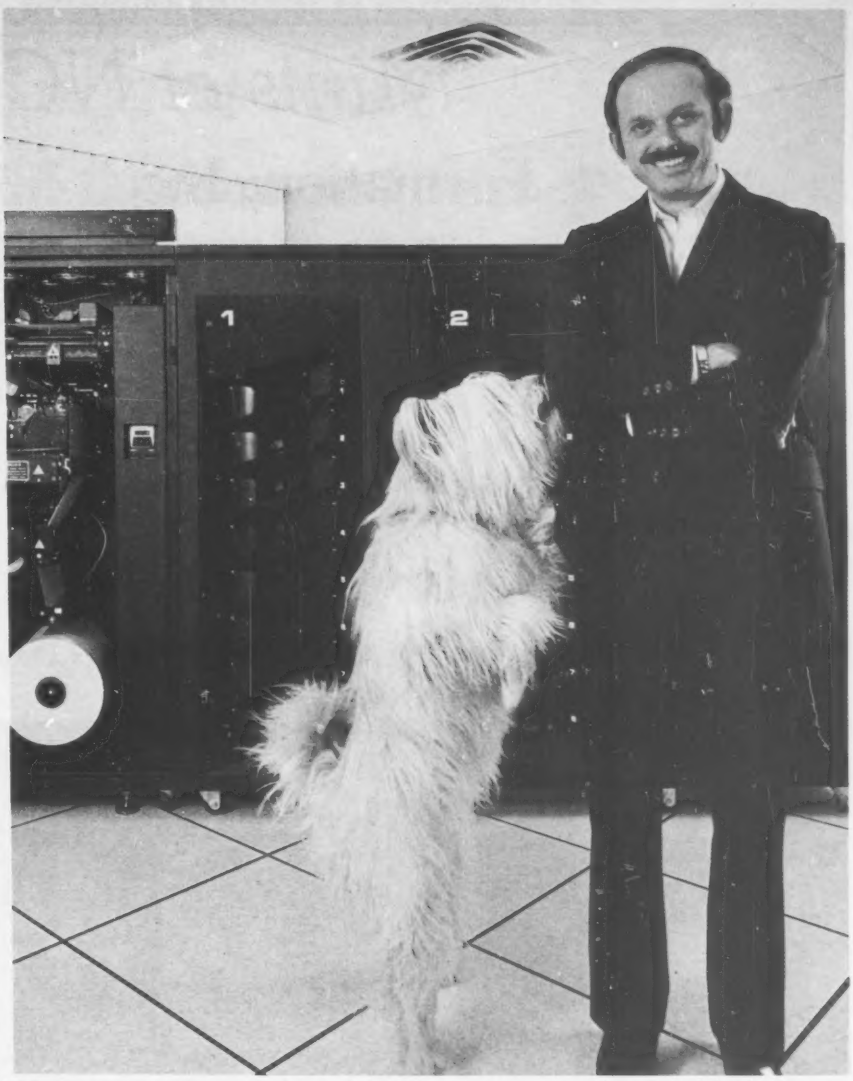
CHICAGO — Point 4 Data Corp. plans to introduce the Mark III minicomputer and accompanying peripherals at Booths 2709 through 2712.

The Mark III uses the main processor for intelligence, which eliminates separate interfaces for each controller, according to the vendor. It accepts the Iris operating program; the Macs and Hips accounting subsystems; Readinet, a project management system; and Stylus, a multiterminal word processing system. All applications have been field-tested.

The Mark III is priced at $5,500 from Point 4 Data Corp., 2569 McCabe Way, Irvine, Calif. 92714.

"18,000 lines a minute and all the processing power of a Level 6. Our new PPS II/E does everything but feed the dog."

Ron Borelli
Director, Page Processing Systems
Honeywell Information Systems



PPS II was a productive printing system to begin with. But now, by giving users access to the power of the Level 6 computer, we have created a system that is a data collector, processor, and printer all in one. So users can customize an output system to fit their particular printing needs.

The new PPS II/E collects data from word processing diskettes and magnetic tapes, as well as from on-line and remote connections to a variety of mainframes. It can even collect data from multiple sources simultaneously. Then, using Level 6 application programs, it organizes and prints this data at speeds as high as 18,000 lines a minute. PPS II/E will even interface with impact printers for specialized requirements such as check printing.

"This is one of the most cost-effective page processing systems ever designed."

On one hand, PPS II/E is a high-speed non-impact printing system, capable of producing up to 18,000 lines a minute. It also punches, collates, perforates, and addresses. PPS II/E lets you print your own forms, choose your own colors, and sizes, and design your own character sets.

More important, PPS II/E is growth-oriented. You can add disk storage or stackers. Increase printing speeds. Design new characters or forms as your applications change. Or add more CPU power or memory.

"Built-in processing power gives PPS II/E unbeatable flexibility."

Of course, the new PPS II/E is also a processing system. And it can accept Level 6 software programs. PPS II/E can be used to relieve your computer during peak load times. Or reserved for new applications development. Or custom-designed to perform a certain function. For example, PPS II/E can change your output processing system into an electronic mailroom—accepting input from data or word processors—organizing, prioritizing, and addressing it before printing for quick and easy distribution.

Efficiency has been enhanced by the addition of a new disk queuing capability that lets you store and merge data coming in from different sources. Now you can organize, process, and print information at your convenience.

In short, PPS II/E is a powerful and versatile system that gives you the flexibility to manage your operation with maximum efficiency. It prints like a demon. It processes like a computer. It does just about everything.

For more information call 800-328-5111. (In Minnesota call collect 612-870-2143.) Or write Honeywell, 200 Smith Street (MS 487), Waltham, Massachusetts 02154. You can also see the new PPS II/E at NCC, Booth 1141.

Honeywell

The ingenuity of people, the power of computers.

Minis at NCC

Formation, Inc.

CHICAGO — Formation, Inc. will feature its 32-bit Formation 4000 Information System, said to be comparable to IBM's 4331 Group 1 computer and software-equivalent to the IBM 370, at Booths 5511, 5512 and 5513.

The Formation 4000 features redundancy, remote diagnostics, solid-state error-correcting memory, sealed-disk Winchester technology, low-power components and large-scale integration circuitry, according to the firm.

The complete system, including minicomputer, disk drives, magnetic tape drives, card readers, CRT terminals, character and line printers, ranges in price from less than $62,000 to $150,000.

Also available will be the firm's Transaction Management System (TMS), an integrated screen handling and data base management package that executes under VM/370.

A second software package shown will be Forman, an on-line, interactive, real-time manufacturing control system that performs closed-loop manufacturing resource planning.

Formation, Inc. is located at 823 E. Gate Drive, Mount Laurel, N.J. 08054.

NCC 1981

Plessey Peripheral Systems

CHICAGO — Plessey Peripheral Systems will unveil a desktop computer with a 28M-byte 8-in. Winchester drive.

The Syst-23VTJ is Digital Equipment Corp. LSI-11/23-based and features a Plessey ¼-in. tape drive as a backup for the Winchester disk.

The Winchester subsystem features the PM-FCV06 single, quad-wide controller board and one 28M-byte PM-FDV06J Winchester fixed-disk drive.

It will interface up to four drives if additional storage capacity is needed, a spokesman said.

The vendor's 15M-byte ¼-in. cartridge tape subsystem, PM-CSV11, satisfies the backup requirements of the fixed-disk Winchester technology and the tape drive utilizes removable DC300-type ¼-in. cartridge tape.

The product will cost $20,760, the vendor said from 1691 Browning Ave., Irvine, Calif. 92714.

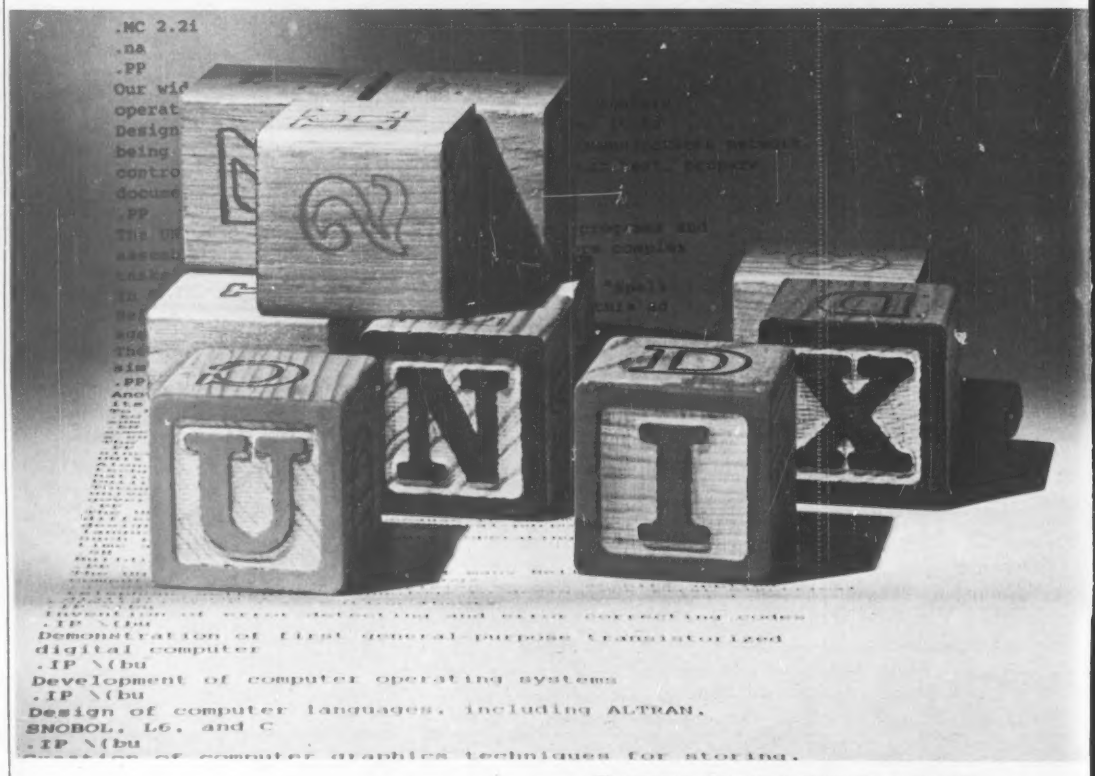
Gimix, Inc.

CHICAGO — Gimix, Inc. will show its line of systems based on the Motorola 6809 microprocessor at Booths 971 and 972.

Supported by the Flex, Uniflex, OS9, Forth, Basic and Pascal languages, Gimix' systems offer 32K bytes of main memory, 1K byte of random-access memory and two RS-232 serial I/O ports, Gimix claimed.

The vendor is located at 1337 W. 37 Place, Chicago, Ill. 60609.

An easier way to use computers... from a pioneer in computing technology.



The computer printout in the picture above contains the instructions and input needed for the *UNIX* system to format and produce the text on the opposite page.

Minis at NCC

Digital Equipment Corp.

CHICAGO — Digital Equipment Corp. will use Booth 701 at the National Computer Conference to spotlight the first public showing of a number of recently debuted products, including the PDP-11/24 small-range minicomputer.

The PDP-11/24 is the firm's lowest-priced system with a Unibus architecture and a megabyte memory capacity.

Other systems on display will include two VAX-11/750 virtual-memory minicomputers in dual disk and disk-tape configurations, the VAX-11/780 high-end 32-bit system and the Datasystem 315 small business computer. The last model is based on DEC's PDP-11/23 minicomputer.

The three VAX systems will be interconnected by the newly released Phase III Decnet-VAX to demonstrate its network management capabilities, virtual terminals and other advanced communications features, a spokesman explained.

The systems will also have Decnet links to a PDP-11 system at the booth, a Decsystem-20 mainframe in Marlboro, Mass., and to DEC's engineering computer network, a spokesman said.

Ethernet Test

DEC will add topping to its demonstration cake by participating in a test run of Ethernet, the local-area communications technique developed by Xerox Corp.

Other products that will make appearances include the Gigi intelligent keyboard for high-resolution color or black-and-white graphics, the RM80 Winchester 124M-byte disk and the RM05 300M-byte disk subsystem. A VS11 raster-scan color graphics terminal will also take part in DEC's product extravaganza.

DEC is headquartered in Maynard, Mass. 01754.

Sharp Electronics Corp.

CHICAGO — Along with a variety of products shown at Booth 4324, Sharp Electronics Corp. will be demonstrating its recently introduced YX 3200 desktop business computer.

The 3200 computer features an expandable 32K-byte read-only memory and a 64K-byte random-access memory.

The system includes two dual-sided, double-density floppy disk drives that can store up to 285K bytes per diskette and a high-resolution CRT display. A bidirectional printer is also included which operates at 80 char./sec and has an 80- or 132-line capability, a spokesman explained.

The computer features an automatic program generator that poses yes/no questions to the user to design needed software programs.

Once entered into the unit's Z80 processor, the program — written in Basic — can be stored indefinitely or used at the operator's convenience.

Sharp Electronics can be reached at 10 Keystone Place, P.O. Box 588, Paramus, N.J. 07652.

Our widely accepted *UNIX*™ operating system is simplifying the use of computers. Designed to handle a variety of applications, it is being used to manage and maintain the telecommunications network, control experiments, develop software, process text, prepare documents, and teach computer science.

The *UNIX* system allows users to take small programs and assemble them like building blocks to perform complex tasks. In text processing, for example, the command "Spell Bell Labs Ad" tells a computer to proofread this ad against a dictionary filed in its memory. The program that performs the task was created by simply combining several smaller *UNIX* programs.

Another useful feature of our *UNIX* operating system is its ease in typesetting mathematical expressions. To typeset an equation like

$$\sum_{i=1}^{\infty} \frac{1}{x_i} = \pi$$

someone need only type: "Sum from i=1 to infinity 1 over x sub i=pi." The computer does everything else.

Since 1969 the Bell System has installed more than 1100 *UNIX* systems. Along with other Bell Labs innovations in computing technology, these systems are enhancing the way the nation's telecommunications network is planned, designed, built, and operated. Through licensing agreements with Western Electric, universities have installed over 800 *UNIX* systems, and government and industrial facilities are using over 400.

The *UNIX* operating system can be used with computers of different manufacturers because it is small, cleanly designed, and written in a general-purpose programming language. Such portability in a computer operating system saves time and money.

Building on the past

The *UNIX* system is just one of many Bell Labs advances in computing science and technology over the years. Among our innovations:

- Application of telephone switching concepts and technology to early computers
- First demonstration of remote computer terminal and data link
- Conception of electronic analog computer
- First design of AND and OR gates for diode circuitry
- Formulation of Information Theory
- Invention of error-detecting and error-correcting codes
- Demonstration of first general-purpose transistorized digital computer
- Development of computer operating systems
- Design of computer languages, including ALTRAN, SNOBOL, L6, and C
- Creation of computer graphics techniques for storing, manipulating, and presenting information
- Development of Fast Fourier Transform
- Design of central processors for switching systems having virtually no downtime

Looking ahead

Computing technology is having a major impact on the telecommunications business. It's increasing the Bell System's ability to provide new services and handle existing ones more efficiently. Today, for example, the nationwide telecommunications network links thousands of software-controlled electronic systems, making it by far the world's largest distributed processing network. We and our partners—Western Electric and the telephone companies of the Bell System—are putting technology to work so that the network will continue to evolve and expand its information-handling capabilities. The object, of course, is to meet the fast-growing and changing needs of Bell System customers.

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Minis at NCC

Centurion Computer Corp.

CHICAGO — At Booths 201 to 204, Centurion Computer Corp., a subsidiary of Electronic Data Systems, will display its Centurion line of business minicomputers.

The exhibit will include the Centurion 6400, a member of the Centurion 6000 series of computers which includes 64K bytes of main memory, a fixed/removable 26.5M-byte rigid disk drive, a 1,920-char. CRT and a 150 char./sec dot matrix printer.

Main memory on the 6400 can be expanded to 256K bytes and up to 32 CRTs can be supported. The system also will support up to eight disk drives of 79.4M bytes each.

Also on display will be the Centurion 200, a desk model configuration consisting of 32K bytes of main memory, a fixed/removable 10.4M-byte rigid disk drive, a 1,920-char. CRT and a 150 char./sec dot matrix printer.

The 200 can be configured with a fixed/removable 20.8M-byte rigid disk drive, in place of the 10.4M-byte drive.

Centurion also will have available a 45 char./sec character printer which is used in conjunction with the Centurion Word Processing software package, which will be demonstrated at the show.

The Centurion 6400 is priced at approximately $40,000. The Centurion 200 costs approximately $27,000 from Centurion Computer Corp., 1780 Jay Ell Drive, Richardson, Texas 75081.

Integrated Computer Systems, Inc.

CHICAGO — Integrated Computer Systems, Inc. (ICS) will be showing its Portable Microprocessor Training Lab (PMTL) with a preassembled interfacing experiment option at Booths 241 and 242.

The PMTL consists of 20 self-training modules in four volumes and a hardware system for hand-on exercises. Texts include modules covering programming fundamentals, real-time interrupt handling, control of programmable interfacing devices and the implementation of closed-loop control systems.

The PMTL costs $1,485 including the interfacing experiment assembly, and the assembly costs $125 if purchased separately.

Also featured will be ICS videotape courses on microcomputer subjects designed for industrial training departments, the firm said from its headquarters at 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

United States Design Corp.

CHICAGO — United States Design Corp. will be at Booth 4901 to show its tabletop time-sharing processor that uses the firm's 8-in. Winchester disk/cartridge tape subsystem and a Digital Equipment Corp.-based processor.

The tapletop system includes a DEC LSI-11/03 processor, 64K- to 256K bytes of random-access memory, a VT-103 CRT terminal with a Q bus backplane and support for up to 14 Ascii terminals, the vendor said.

Also on display will be the Irwin International, Inc. Model 510 5.25-in. 10M-byte disk drive with an integrated 10M-byte tape that is interfaced to the LSI-11 Q bus by the USDC intelligent controller.

The firm also offers device handlers for the RSTS/E, TR-11, RSX, TSX and Unix operating systems, the vendor said from 2411 Crofton Lane, Crofton, Md. 21114.

Smoke Signal Broadcasting

CHICAGO — Smoke Signal Broadcasting, manufacturers of the Chieftain series of business computer systems, will be exhibiting in Booth 534.

Smoke Signal will be showcasing its newest system, the Chieftain 98W10, a 10M-byte hard disk system. It will be running on OS-9 Level I multiuser, multitasking operating system and application software. The base price of the system is $8,695.

The vendor can be contacted at 31336 Via Colinas, Westlake Village, Calif. 91362.



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Minis at NCC

Measurement Systems & Controls

CHICAGO — Measurement Systems & Controls will be showing its System 2800 at Booth 849.

The unit is designed to meet the needs of single or multiuser operations, and is available in floppy or fixed disk configurations, the vendor said.

System 2800 uses the CP/M operating system and comes with an enhanced CBIOS.

It provides improved diagnostic reporting capabilities and supports multitasking operations, according to the vendor.

The firm will have its full line of memory boards and processor and I/O disk controller boards on display, the vendor said from its headquarters at 1601 Orangewood, Orange Calif. 92668.

SSM Microcomputer

CHICAGO — SSM Microcomputer Products, Inc. will be showing its line of computer-controlled video disk playback systems in Booths 4021 and 4022.

The firm has developed an interface unit, the UEI, that permits control of a Discovision disk player from a microcomputer keyboard. The UEI allows direct access to any one of 54,000 frames stored on the disk, the vendor said.

Also on display will be the firm's IEEE P696.1 bus-based computer system. The IEEE P696.1 is the proposed standard delineating the S-100 bus. The firm's P696.1 line includes 8080- and Z80-based microprocessors; video boards; serial, parallel and serial/parallel I/O boards; and random-access memory (RAM) and erasable programmable read-only memory (Eprom) boards.

The company also offers a board that reportedly turns an Apple II or Apple II Plus processor into an IEEE 488 bus controller.

The vendor is located at 2190 Paragon Drive, San Jose, Calif. 95131.



Custom Systems, Inc.

CHICAGO — Custom Systems, Inc. will introduce Model 130 magnetic tape coupler, Programmable Terminal Interface (PTI) Model 420, Micro Mutt Model 510 and Multi-Function I/O Model 400, along with its current line of controllers, cartridge disks, memory control boards, QTY multiplexers and wirewrap development boards at Booths 773 and 774.

Model 130 reportedly facilitates the integration of .5-in. tape drives and Data General Corp. or equivalent minicomputers. It incorporates a 1K-byte first-in/first-out buffer, gap length select feature and tape speed control lines. It is a single board.

Full emulation of DG's 6026 magnetic tape subsystem ensures installation using unmodified DOS, RTOS, RDOS and AOS operating systems, Custom Systems said.

PTI Model 420 is intended to provide the control of up to 16 local terminals or printers. Each line may be individually configured for current loop or EIA/RS-232 electrical interface. The PTI is plug-compatible with any DG Nova or Eclipse processors and operates directly off the CPU bus, the vendor said.

Micro Mutt 510, a remote diagnostics tool which is said to provide an OEM with access to a customer's CPU for software debugging/updating and hardware diagnostic support, also is being displayed.

The Model 400 is a multidevice controller which interfaces to the low-speed peripherals most commonly used in DG minicomputer systems, the vendor said. These interfaces include two console device controllers, a real-time clock, a parallel line printer controller and a 4241-compatible eight-channel asynchronous multiplexer with full modem control.

The Model 130 tape coupler lists for $1,490. Model 510 Micro Mutt is priced at $895 for single quantities, with multiple-quantity discounts available. There is a one-time charge of $100 for special-parameter Prom sets.

The PTI Model 420 costs $2,200 and the Multi-Function I/O Model 400 is priced at $2,100, the vendor said from 6850 Shady Oak Road, Eden Prairie, Minn. 55344.

Mini Peripherals at NCC

Emulex Corp.

CHICAGO — Emulex Corp. will introduce its newest single-board, quad-size disk controller, the SC02, at Booths 154, 155, 156 and 157.

The SC02 is designed to interface a wide variety of 8-in. and 14-in. small- to medium-capacity hard disk drives with Digital Equipment Corp. LSI-11 microcomputers, the company said.

Also on display will be the company's CS11/H communications multiplexer which, using just one hex-size controller board and occupying a single Unibus slot, provides up to 64 lines for terminals, printers and other communications I/O.

The SC02 is available in two models for emulation of specific DEC subsystems. The SC02/A emulates the RP11E controller combined with multiple RP02 and RP03 disk drives to support all types of drives in the 8M- to 160M-byte range. The SC02/C emulates the RK611 controller combined with multiple RK06 and RK07 drives to support cartridge module drives with both fixed and removable media in the 16M- to 96M-byte range.

Both models use the SMD interface and can support up to two drives per controller. Additional versions will be offered later that will support other interfaces such as the SA4000 and Ansi standard, the company said.

The SC02 provides sockets for installing bus terminator resistors plus programmable read-only memory chips for execution up to a 512-word bootstrap program. Also on the board is a BDV-11-compatible, software-controllable line time clock.

The SC02 is priced under $2,000 in quantities of 100 or more from Emulex Corp., 2001 E. Deere Ave., Santa Ana, Calif. 92705.

Persci, Inc.

CHICAGO — Persci, Inc.'s Model 1180 controller will be on display in Booth 680.

The Model 1180 is a single- (FM encoding) or double-density (MFM) unit that operates with IBM Diskette 1 or 2D formats in single- or double-sided drives. It will control up to two Model 299B or 277 drives, the firm said.

More details are available from Persci, 12210 Nebraska Ave., W. Los Angeles, Calif. 90025.

MDB Systems, Inc.

CHICAGO — An asynchronous serial line adapter for use with Digital Equipment Corp. PDP-11 computers will be shown by MDB Systems, Inc. in Booths 1090 and 1091.

The MDL-11 serial line interface features the functions of five DEC modules and offers RS-422, a buffer ready circuit, on one board, the vendor claimed.

The product permits full- or half-duplex communications between PDP-11 computers and terminals or modems via RS-232-C, 20A current loop or RS-422 circuitry. Sixteen switch-selectable bit/sec rates from 50K- to 19.2K bit/sec are standard.

It costs $825, the vendor said from 1995 N. Batavia St., Orange, Calif. 92665.

ABW Corp.

CHICAGO — The ABW Corp. will display a read-only-memory-based device that enables an Apple Computer, Inc. Apple II computer to emulate a Tektronix, Inc. 4010 series graphics terminal.

The company will show its new product at Booth 4433 at the National Computer Conference here.

Teksim, the Tektronix simulator, employs distributed processing in its programming approach and uses Apple's high-resolution plotting capabilities.

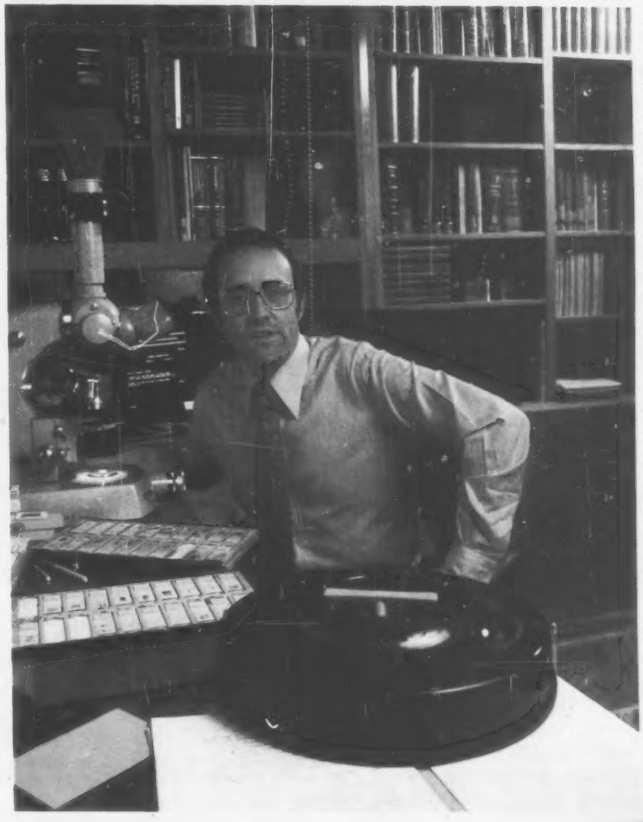
No modification to the host-resident program is required, the vendor claimed.

Although the Apple has about one-quarter of the resolution of the Tektronix terminal, the Teksim-Apple configuration offers users a substantial cost advantage and exclusive features such as multicolored displays, selective erase and standard video output that lets any TV set function as a monitor.

The unit is priced at $475.

ABW is located at P.O. Box M 1047, Ann Arbor, Mich. 48106.

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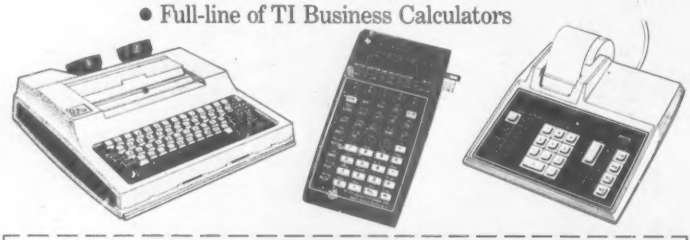
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Peripherals at NCC

Centronics Data Computer Corp.

CHICAGO — A 600 line/min band printer system and a 150 char./sec desktop printer from Centronics Data Computer Corp. will be on display at Booth 933.

Offering plug-compatibility with various Digital Equipment Corp., Data General Corp. and IBM systems, the LP series of band printers are available in two versions — a standard pedestal-mounted unit with open paper path and a totally enclosed version to provide a low noise level in an office environment.

The series currently includes interfaces for DEC's PDP-11, LSI-11 and VAX-11/780 systems, DG's Eclipse and Nova systems and IBM's Series/1.

Operating features include an operator-controlled self-test capability, a choice of 48-, 64-, 96- and 128-character set print bands and paper jam and paper-out sensors.

The Model 150 char./sec desktop printer includes three-way paper handling, compressed print, adjustable snap-on tractors and a roll paper holder.

Centronics is headquartered in Hudson, N.H. 03051.

Piiceon, Inc.

CHICAGO — Booth 4611 will contain a Piiceon, Inc. display featuring its 128K-byte dynamic random-access memory (RAM) board.

Dubbed Superstore, the board has been optimized for Alpha Micro System computers and can be configured for either 8- or 16-bit processors. The boards are organized as eight blocks of 16K-bytes divided into two 64K-byte memory blocks controlled by individual I/O ports.

Superstore is priced at $2,000 in single quantities with discounts available on high-volume orders of 100 or more.

Piiceon will also exhibit its 16-bit intelligent terminal for word processing and office automation applications.

The Model 1000 offers a full-page 66- by 80-char. video display, 64K bytes of RAM and 8K bytes of programmable read-only memory and is designed for adding word-processing capability to host computers varying in size from micros to large mainframes.

Operating under CP/M software, the Model 1000 is priced at $8,654 in OEM quantities of 25, Piiceon said from 2350 Bering Drive, San Jose, Calif. 95112.

General Robotics Corp.

CHICAGO — General Robotics Corp. will show several Digital Equipment Corp. LSI-11-based microsystems at Booth 1665.

The latest entry into the firm's Constellation Series is the 5¼-in. minifloppy Scorpio, a desktop model to be aimed at the first-time user market. The Scorpio system is packaged with an LSI-11/2 CPU, 64K bytes of memory, serial I/O port and two double-sided, double-density minifloppy disk drives.

Besides having a stepping rate reportedly 10 times faster than previously manufactured minifloppy systems, the Scorpio is said to be smaller and less expensive than the DEC RXO2 8-in. floppy disk system and provides 1.8M bytes of disk storage, compared with 1M byte for the DEC system.

The 10M-byte 8-in. floppy Winchester Super Gemini features an average access time of 70 msec. It can be configured with an LSI-11/2 or LSI-11/23 CPU, 64K bytes of memory, a DLV11 serial asynchronous I/O interface, one 1.25M-byte floppy disk drive and one 10M-byte Winchester drive, General Robotics said.

The Gemini and Tristar 8-in. floppy disk systems — also to be featured — are fully software-, hardware- and media-compatible with the Digital Equipment Corp. RXO2 systems and offer more storage capacity, according to General Robotics.

General Robotics is located at 57 N. Main St., Hartford, Wis. 53027.

Mini Peripherals at NCC

Corvus Systems, Inc.

CHICAGO — Corvus Systems, Inc. has announced plans to exhibit its full line of mass storage and Digital Equipment Corp. LSI-11-compatible products at National Computer Conference Booth 3014.

Corvus will show its Model 5L fixed disk, which sells for less than $3,000 in OEM quantities and has an unformatted data capacity of 6.9M bytes. The 5L's minimum seek time is 10 msec and its average seek and latency times are 50- and 8.3 msec, respectively, a spokesman asserted.

The Model 5L disk emulates DEC's RL01 cartridge drive and appears to the LSI-11 bus as a DEC RLVII controller supporting a single cartridge disk drive, the spokesman explained.

Corvus also will show its add-on 5M-byte Winchester disk systems for such microcomputers as Apple Computer, Inc.'s Apple II and III, Tandy Corp.'s Radio Shack TRS-80 and Intertec Data Systems, Inc.'s Superbrain.

And the vendor is scheduled to exhibit a 20M-byte plug-compatible Winchester disk drive series for DEC LSI-11 systems.

Corvus headquarters is at 2029 O'Toole Ave., San Jose, Calif. 95131.

Data Systems Design, Inc.

CHICAGO — A 30M-byte version of Data Systems Design, Inc.'s DSD 880 Winchester/floppy disk memory system will be the focus of Booth 5322.

The system is available with either single-sided 8-in. floppy (DSD 880 S/30) or double-sided 8-in. floppy (DSD 880 D/30), and both versions use a Winchester disk drive.

The models are compatible with Digital Equipment Corp. hardware, software and media. An X/30 can be installed with either a PDP-11- or an LSI-11-based system with no changes to the operating system.

The storage system emulates three RL02s, providing 31.2M bytes of formatted storage, and can be used with either RT-11 or RSX-11 operating systems.

DSD is located at 2241 Lundy Ave., San Jose, Calif. 95131.

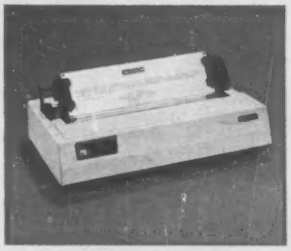
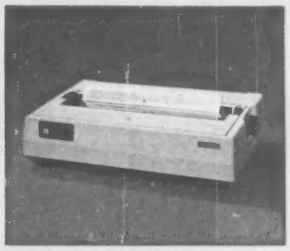
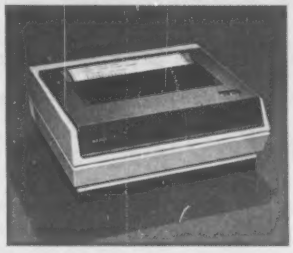
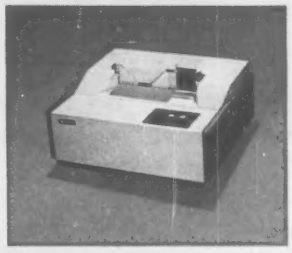
New World Computer

CHICAGO — A Winchester disk drive featuring access time of 8 msec, multiple head assembly and eight read/write heads will be displayed at Booth 5509 by New World Computer Co.

The Minimikro-Disc V-ITF requires 5 msec to change heads from one cylinder to the next and places storage capacity beneath the heads at all times, accessible within one disk rotation, the vendor claimed.

Available immediately, the Minimikro-Disc V-ITF is priced at $700 in OEM quantities of 1,000 from New World Computer Co., Suite 120, 3176 Pullman St., Costa Mesa, Calif. 92626.

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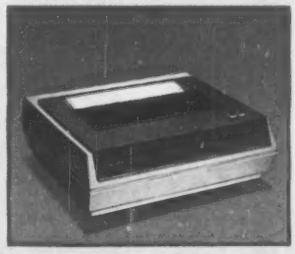
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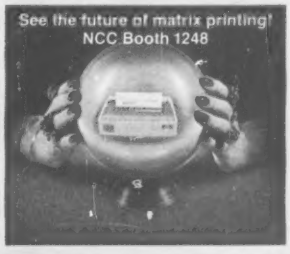
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Mini Peripherals at NCC

Monolithic Systems Corp.

CHICAGO — Monolithic Systems Corp. (MSC) will introduce a pair of software development stations for Digital Equipment Corp. systems, a 256K-byte memory system for the DEC LSI-11/23 microcomputer and add-in memory for DEC's PDP-11/70 system at Booths 123-127.

The software development stations are the MSC 8801 and 8802. The MSC 8802's multiprocessor architecture reportedly reduces software development I/O overhead by as much as 80%. The system utilizes the MSC 8009 and MSC 8007A computers with 80K bytes of random-access memory (RAM).

The MSC 8801 and 8802 systems, running under CP/M, include a Multibus compatible with Zilog, Inc.'s Z80A-based computer with 64K- or 80K bytes RAM, two double-density 8-in. floppy disk drives, a seven-card slot Multibus chassis and heavy-duty system power suppliers.

Features include a key activated power on/off switch which controls all system power as well as three external ac outlets, provision for up to eight serial communications channels, two 50-pin cable connectors for parallel I/O interfaces, three BNC connectors for video graphics applications and six spare card slots.

The MSC 4804, the 256K byte memory system for the DEC LSI-11/23 computers utilizes 64K RAM technology and occupies one DEC Q-Bus slot. Available in 18 bit and 22 bit address versions, the MSC 4804 can be addressed on any 16K boundary in capacities of 128K- or 256K bytes and uses jumper pins instead of switches for higher reliability.

The MSC 3611 system of add-in memory for the DEC PDP-11/70 is a compatible replacement for DEC's MK11-CE memory, the vendor said. The two board set provides 512K bytes of expansion memory that directly plugs into DEC's MK11 semiconductor box.

The 3611 complements MSC's PDP-11/70 add-on system (MSC3602).

The single unit price of the complete MSC 8801 system, including the computer, software, floppy disk drives, terminal and printer is $7,985. The price for the MSC 8802 is $9,675. OEM pricing is available upon request. Delivery is anticipated within 45 days.

The price for the MSC 4804 is $2,200 in single quantities, with OEM, educational and GSA discounts available. Prototype quantities are available immediately, with production volumes in 30 days, according to MSC.

The price for the two-board (512K byte) MSC 3611 set is $4,400, in single quantities with OEM, educational and GSA discounts available.

MSC is located at 84 Inverness Circle E., Englewood, Colo. 80112.

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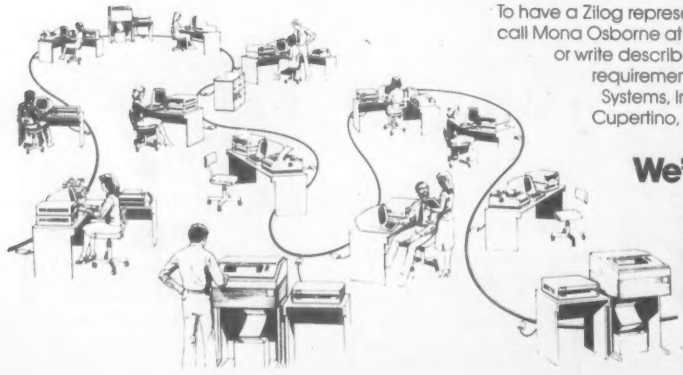
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Shugart Associates

CHICAGO — Shugart Associates' 5.25-in. Winchester disk drive family will be displayed in Booth 1201.

The SA600 series comes in three versions: the single-platter SA602, with 3.33M bytes of unformatted storage capacity; the double-platter SA604, with 6.66M bytes; and the 10-M byte triple-platter SA605. The series will be available in the third quarter, in OEM quantities of 500 units. Prices begin at $760.

Shugart's two 5¼-in. minifloppy disk drives with track densities of 96 track/in. will also be showcased. The disks are priced at $325 and $400 in quantities of 100 from the vendor at 475 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Datasystems

CHICAGO — A line printer for the IBM Series/1 will be displayed by Datasystems at Booth 1275.

The DLP-3300 is a single printed circuit board that plugs into the chassis of a Series/1 processor and features increased diagnostic capabilities, provides direct memory access (DMA) interfacing between the processor and printers and provides an external self-test which certifies operation of printer and cables.

The DLP-3300 is priced at $1,825 from Datasystems, 8716 Production Ave., San Diego, Calif. 92121.

Mini Peripherals at NCC

Lobo Drives International

CHICAGO — At Booths 4211-4214, Lobo Drives International, Inc. will display Ldos, an operating system the company claimed will bridge the gap between Tandy Corp.'s three Radio Shack TRS-80 microcomputer models and LCA-22, a software-compatible controller board for Apple Computer, Inc. equipment users.

Ldos is device-independent and supports all known disk drives and most peripherals, the vendor said. It provides keyboard type-ahead, auto-repeat and a "Key Stroke Multiply" feature that allows users to define phrases for each alphabetic key.

To its standard library commands, Ldos adds extended library, extended utilities, enhancements to Basic and its own set of device drivers. Available immediately, it is priced at $149.

Lobo's LCA-22 controller is software-compatible with Apple DOS, contains 256 bytes of on-board boot read-only memory and controls up to four 8-in. single- or double-sided, single- or double-density disk drives with a storage capacity of 4.4M bytes.

Priced at $699, the LCA-22 features an average access time of 200 msec and direct memory transfer rates of 62.5K byte/sec. It includes a controller card, cable, diskette and documentation. Deliveries already have begun.

These two products will be displayed along with Lobo's current line of products, the vendor said.

Lobos Drives is located at 354 S. Fairview Ave., Goleta, Calif. 93117.



R2E of America

CHICAGO — R2E of America will be showing its line of OEM systems at Booths 281 and 684.

On display will be the firm's System X, a Z80-based system with 64K bytes of main memory which is available in three basic configurations.

The XP/1 configuration includes two single-sided minifloppy disk drives and 900K bytes of on-line storage.

The XP/2 configuration includes two double-sided minifloppy drives that provide up to 1.8M bytes of on-line storage. An optional 20M-byte CII Honeywell Bull D140 disk drive is also available. That drive provides 10M bytes of storage on a fixed disk and a 10M-byte removable cartridge, the vendor said.

The XP/3 configuration includes one double-sided minifloppy disk drive that offers 900K bytes of storage and a 5M-byte 5.25-in. micro-Winchester hard disk.

The XP/3 will be introduced at NCC. Prices start at $7,200, the vendor said from 32200 Solon Road, Solon, Ohio 44139.



Power Systems at NCC

Sola Electric

CHICAGO — At Booths 1629 to 1632, Sola Electric will demonstrate its recently debuted line of uninterruptible power supply (UPS) systems and a variety of other power protection products.

Available in single, parallel and parellel redundant configurations, the UPS systems are intended to protect large-scale mainframes; electronic industrial process controls; security, medical and communications systems; and other equipment requiring a constant supply of power.

Inverter Technology

The systems come in ratings of 225-, 275- and 325 KVA and utilize Sola's 12-step, pulse-width-controlled inverter technology — said to improve output electrical characteristics and achieve operating efficiencies as high as 92%.

The UPS systems also feature the firm's expanded operator control panel which includes a status indicator "mimic bus" that provides a visual representation of system power flow for performance monitoring, a spokesman said.

Other products to be shown at the Sola booths include a 70 VA micro/minicomputer regulator and an auxiliary battery pack with self-contained battery charger for use with the company's Mini UPS, Sola Electric said.

The Mini UPS, also to be demonstrated, is a portable, plug-in uninterruptible power supply that operates continuously between the ac line and critical load and furnishes up to 20 minutes of emergency power in the event of line failure.

Sola, a division of General Signal, is headquartered at 1717 Busse Road, Elk Grove Village, Ill. 60007.

Topaz, Inc.

SAN DIEGO — Topaz, Inc. will show National Computer Conference attendees its power protection products in Booths 1412, 1413 and 1414.

These products include uninterruptible power systems, voltage regulators and line conditioning devices, the vendor said.

Topaz is based at 3855 Ruffin Road, San Diego, Calif. 92123.

Lortec Power Systems, Inc.

CHICAGO — At Booths 503 and 504 here, Lortec Power Systems, Inc. will exhibit the redesign of its 15-KW, 30-KW and 60-KW three-phase uninterruptible power systems (UPS) into smaller units.

Available in both 50-Hz and 60-Hz models, Lortec claims the units can result in floor space savings of up to 33%.

They reportedly can be expanded on-site to double their original power rating. Expansion kits contain slave inverter and rectifier cabinets which are controlled by existing UPS units.

Prices for the Lortec UPS systems range from $20,000 to $80,000, depending upon the power rating, the configuration and battery reserve, the vendor said from 5214 Mills Industrial Parkway, North Ridgeville, Ohio 44035.

Nova Electric Manufacturing

CHICAGO — Nova Electric Manufacturing Co. will be showing its uninterruptable power systems designed for minicomputer and microcomputer applications in Booths 672 and 673.

The 2.5 KVA system offers an optional solid-state or electromechanical transfer switch. It provides 125% overhead for 15 min, 150% for one min and 1,000% for five cycles via the solid-state transfer switch, the vendor claimed.

It will deliver full-rated power over a temperature range of -20 degrees to +50 degrees C. The standard system was designed for operation at 120 Vac.

It costs $4,275.

The Model 11-15K-3/6 uninterruptable power system features solid-state design and modular construction. The product offers protection from power failures, brownouts, line transients and high-frequency spikes, the vendor claimed.

Circuit protection is accomplished by the use of circuit breakers instead of fuses commonly used in competitive systems, a spokesman said.

Application areas include computer backup, process control and communications (video, data, telemetry and telephone).

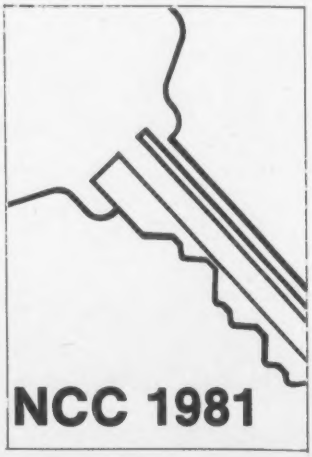
The unit costs $17,435, the vendor said from 263 Hillside Ave., Nutley, N.J. 07110.

Cyberex, Inc.

CHICAGO — Cyberex, Inc. (Booths 792 and 793) will be showing its megawatt-range uninterruptible power systems.

Designed for systems with 400 KVA and higher power requirements, the Cyberex line features solid-state circuitry, alphanumeric display and time-stamped hard-copy tracking of computer room events.

The vendor is headquartered at 1130 Hanna Building, Cleveland, Ohio 44115.



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Power Systems at NCC

Franklin Electric

CHICAGO — A solid-state 60 Hz to 415 Hz converter/uninterruptible power system (UPS) announced by Franklin Electric will be displayed at Booths 1348 and 1349.

The Model 475 is rated at 75 KVA and achieves efficiencies of 89% at full load and 84.5% at 33% load, the company claimed.

The Model 475 is priced at $42,500.

Franklin Electric is headquartered at 995 Benicia Ave., Sunnyvale, Calif. 94086.

International Power Machines Corp.

CHICAGO — International Power Machines Corp. (IPM) will feature its Customer Information System (CIS) at Booths 1441, 1442 and 1443.

The CIS is one of IPM's newest Z80 microprocessor-based 100KW/125KVA uninterruptible power systems (UPS).

The system includes a keypad and LED display for reporting specific alarms and values, the company spokesman said.

Instant Access

PM said that during abnormal conditions CIS provides data center personnel with instant access to correct recovery procedures, improved visual and audible alarms, increased information about power sources and a fail-safe audit trail of conditions within CIS in case of power failure.

IPM may be reached through P.O. Box 746, Mesquite, Texas 75149.

LaMarche Mfg.

CHICAGO — Over 30 self-contained uninterruptible power supply (UPS) systems for 24V, 48V or 120V dc operation with sizes ranging from 500 VA to 5,000 VA will be shown at Booth 541 by LaMarche Manufacturing Co.

The models are priced from $2,731 to $9,915.

LaMarche Manufacturing Co. is headquartered at 106 Bradrock Drive, Des Plaines, Ill. 60018.

Dranetz Engineering Laboratories

CHICAGO — Dranetz Engineering Laboratories, Inc. will demonstrate its family of Power Line Disturbance Analyzers next week in Booth 1757.

The Series 606 portable instruments are designed for continuous unattended operation while they store, analyze, classify and print out quantitative data, according to a vendor spokesman.

A permanent record of disturbances — made via an internal alphanumeric tape printer — gives the time of disturbance, phase, duration, direction and a summary of the disturbances, the spokesman continued.

Dranetz is located at 1000 New Durham Road, Edison, N.J. 08817.

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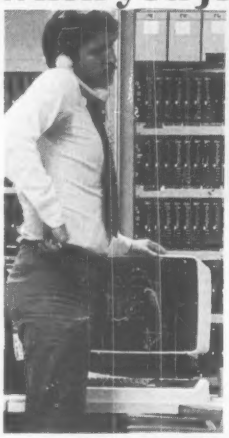
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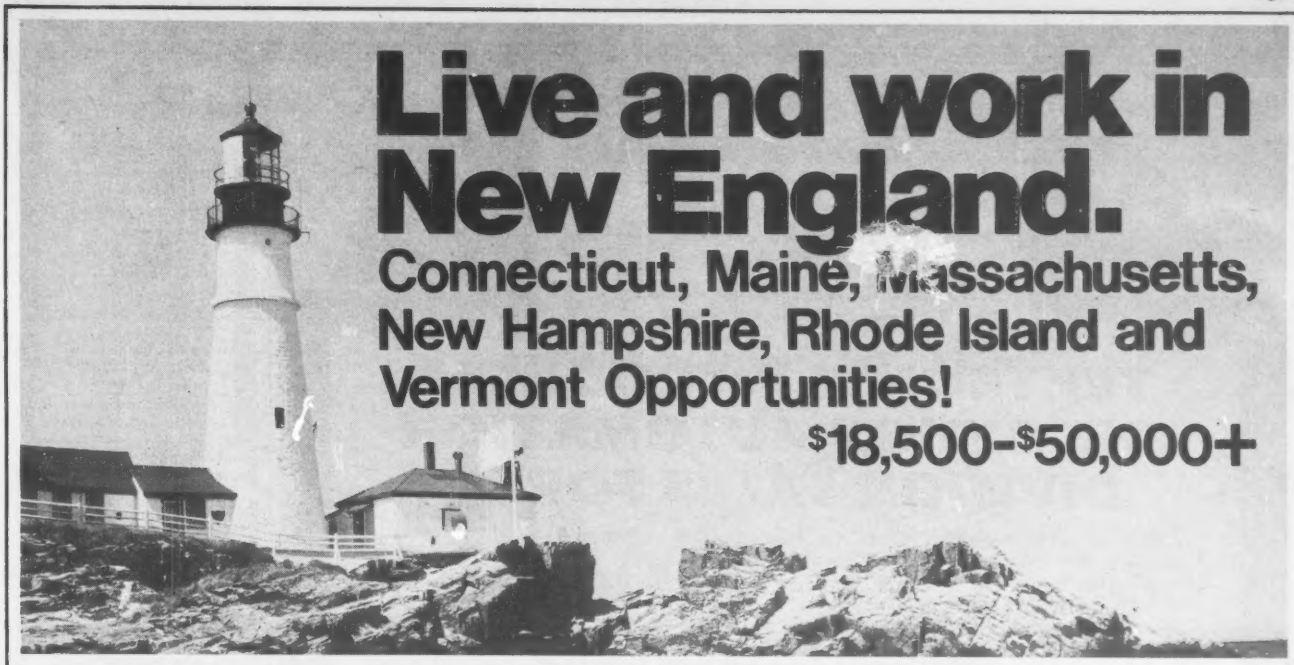
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Senior Software Engineer. Senior staff position with Fortune 50 company responsible for corporate consulting projects involving the development of real-time mini/microcomputer based systems. Requirements include strong project management and application experience with minicomputers in various real-time and commercial applications. To $50,000.

Systems Design Engineer. Staff position in R&D systems development group for major computer based terminal systems vendor. Requirements include mini/micro systems hardware and software design with exposure to real-time terminal based systems. Will work from the functional specification level on up to systems implementation. To $36,000.

CICS Programmer Analysts. Hartford suburban employer has just started a development project which requires ten individuals with two years IBM 370/OS COBOL and CICS (Command or Macro) development programming. Potential for promotion to team leader positions. To $27,000.

Programmer Analysts—IMS Training. Leading edge user of IMS DB/DC seeks several individuals for applications development, data dictionary, DB/DC design, and technical support positions. Two years IBM 370/OS COBOL or BAL with exposure to DB/DC concepts preferred. To $25,000.

Systems Programmers. Fortune 50 financial organization with multiple suburban data centers seeks individuals with two years experience in MVS, IMS or TCAM internals. Excellent opportunity for training and advancement. To $32,000.

Manager of Decision Support Systems. Highly visible staff position reporting to MIS Director. Individual should have good communications skills, an in-depth knowledge of mainframes and a working knowledge of minicomputers. Responsibilities will include exploring new technologies, identification of business needs and senior management interface. To $37,000.

Internal Consultant—Distributed Processing. Fortune 500 organization with headquarters in Hartford seeks an Internal Consultant with experience in IBM 8100/3033 technologies. CICS, IMS and minicomputer experience preferred. Individual will evaluate DDP systems and apply to various business applications. To $35,500.

Project Leader—Electronic Mail. Sophisticated, state-of-the-art financial institution seeks individual to install a CICS, host based electronic mail and word processing system corporate-wide. IBM 370/3033, CICS and SNA experience is highly desirable. To $30,000.

Programmer Analyst. Multidivision Fortune 500 manufacturer seeks professionals with two years IBM OS/COBOL programming and analysis experience. Position entails development and support of financial and manufacturing systems in COBOL with CICS and TOTAL (DBMS). Degree required. To $26,000.

Senior Systems Programmer. Fortune 50 diversified financial institution with headquarters in a Hartford suburb seeks a Senior Systems Programmer with large IBM mainframe experience for a highly visible internal consulting role. CICS and IMS exposure desired. To $31,500.

Management Science Analysts. Southern Connecticut conglomerate is in need of two Management Science Analysts to develop computer models using operations research techniques. Two years of OR experience using FORTRAN is required. To $34,000.

Tech Services Group—Systems Programmers. Ground floor opportunity to head the Tech Services Group of a new division of this Fortune 50 corporation. Environment will be 4341 OS/MVS, DL/1 and CICS. Will hire own staff of three to four systems programmers. Requirements are two years of OS/MVS, DL/1 or CICS experience. To $45,000.

Massachusetts

Applications Programmer—IMS Training Provided. Boston based international manufacturer/distributor seeks experienced COBOL Programmers to participate in new application development. IBM COBOL experience required. To $24,000.

Systems Programmer/Minicomputer Vendor. World's leading manufacturer of small business and word processing systems requires Systems Programmer for in-house IBM 3033. In-depth knowledge of OS/MVS required. Will train in CICS. Future mobility to minicomputer software development group. To $35,000.

Project Leaders—New Corporate Data Center. Major medical services firm is implementing a new corporate data center and seeks experienced Project Leaders with marketing and manufacturing systems experience. IBM OS/COBOL experience preferred. To $38,000.

Senior Programmer Analyst. Rapidly growing major minicomputer manufacturer requires experienced PL/1 Programmer with order entry or payroll background. CICS preferred. To $30,000.

Senior Systems Consultant. Opportunity to apply a multiple language, multiple technology background in a marketing support position implementing varieties of distributed processing systems for a major New England computer vendor. Local travel involved. To $35,000.

Systems Engineers. Two positions for people with knowledge of minicomputer business applications or word processing systems and BASIC or COBOL programming to provide complete technical pre- and post-sales support. Rapid advancement to management or corporate staff marketing positions. To $26,000.

Senior FORTRAN Programmer Analyst. Opportunity to develop new interactive application software for both IBM and DEC computers for firms specializing in investment analysis and financial management systems. To $40,000.

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Senior Systems Programmer. Key position for the development of performance software to run on IBM computers. Ten to fifteen years experience plus a knowledge of BAL and IBM internals is necessary. Will develop software to run without the benefit of an operating system. Degree required. To $35,000 plus stock options.

Minicomputer Programmer/Graphics. CAD/CAM industry leader requires professional to develop applications and systems software. Requires Assembly language or FORTRAN in a mini/micro environment. Mechanical engineering experience preferred. To $35,000.

Programmer Analyst. Prestigious New England consulting firm specializing in major data base/data communication systems development requires three years experience in IMS, IDMS, CICS or TOTAL and COBOL. To $29,000.

Systems Programmer—Install 3033/MVS/IMS. Suburban Boston based Fortune 500 company seeks experienced Systems Programmer to plan and implement a conversion from an IBM 370/158 OS/VS2 to 3033 OS/MVS. Will also be responsible for new IMS installation. To $35,000.

Senior Programmer. Major banking service corporation requires good Assembly language skill at all levels to help in major on-line systems development effort. Banking background and CICS preferred. To $32,000.

Systems Programmer/IMS Training. Fortune 500 organization with national headquarters in a Boston suburb seeks a Systems Programmer in an OS/MVS environment. Training in IMS and Teleprocessing provided. To $35,000.

Director Systems Engineering. This key individual will manage the applications group and the systems group in the development of a performance monitoring system. Ten to fifteen years experience in applications and systems development on IBM mainframes and DEC microprocessors preferred. Degree required. To $45,000.

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Programmer Analyst—CICS Training. Largest supermarket/drugstore warehouse supplier in the Maine, New Hampshire and Vermont region seeks a competent COBOL Programmer Analyst to convert existing batch financial applications to on-line. Will train in CICS. IBM 370/DOS/VS environment. To $22,000.

Senior Analyst—IMS Training. National insurance company seeks an individual with experience in COBOL in an OS/VS2 environment. Insurance background preferred. Will train in IMS. To $28,000.

Minicomputer Programmers. International hardware manufacturer seeks individuals with experience in BASIC/BASIC PLUS. Will develop internal manufacturing applications to be used in a distributed data processing network. Will train in telecommunications. To $25,000.

Senior Software Development Engineer. Peripheral manufacturer seeks individual with a strong background in microprocessor assembler. These positions are in the new products area for developing floppy disc subsystems and advanced printer firmware. B.S. Electrical Engineering required. To $36,000.

Programmer Analyst—Learn CICS. Large northern Rhode Island firm seeks professional with three years OS/COBOL experience. CICS training provided. To $26,000.

Scientific Programmer Analyst—Real-Time Systems. Major Southern Rhode Island consulting firm seeks professional with real-time programming experience in FORTRAN or Assembler on DEC PDP-11 or other similar equipment. To $33,000.

Programmer Analysts. Providence organization with IBM 4341 DOS/VSE will train PL/1 and COBOL Programmer Analysts in DB/DC medical applications. To $27,000.

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Academic computing services at the University of Wisconsin — Eau Claire is a rapidly growing department with a newly acquired computer system. We are looking for someone to grow with us in the area of systems programming and operating systems maintenance. Requirements include a degree (master's preferred), appropriate computing background, and good communications skills. Honeywell experience would be a plus. Eau Claire is a city of 50,000 in beautiful Northwest Wisconsin, just 90 miles from the twin cities. This full time, annual academic staff appointment begins as soon as possible after July 1, 1981. Salary commensurate with training and experience. Apply by May 15, 1981 to:

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Responsible for support to academic and administrative computing at the University utilizing a Xerox 560 timesharing computer system. Minimum of Bachelor degree, FORTRAN and COBOL programming experience, working knowledge of statistics. Salary $12,000 with good fringe benefits. Send resume to Mr. Richard Borst, Alfred University, Alfred, NY 14802. An Equal Opportunity/Affirmative Action Employer.

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Please do not phone.
For a confidential, local interview, send your resume including work experience, salary requirements and personal data to:

Oasis Oil Company of Libya, Inc.
Personnel Representative
1270 Avenue of the Americas
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PENNSYLVANIA TURNPIKE COMMISSION
Harrisburg, Pennsylvania

NOTICE TO INTERESTED PARTIES (STEP I)
REQUEST FOR TECHNICAL PROPOSALS
FARE COLLECTION SYSTEM REPLACEMENT

Sealed Technical Proposals and Qualification Statements for Fare Collection System Replacement, Contract No. 6924-79-530, may be submitted by interested parties to Mr. W.S. Cornelius, Director of Purchases, at the Administration Building, Highspire, Pennsylvania (Mailing Address: Post Office Box 8531, Harrisburg, PA 17105), until 11:00 a.m., Local Time, on the 1st day of July, 1981.

Work to be performed under this contract consists of a new state-of-the-art fare collection system to replace the existing electro-mechanical fare collection system. The new system is to be designed, fabricated, tested, installed and maintained, and includes, but is not limited to, computerized toll terminals, toll plaza computers, scale interfaces, treadle interfaces, photogate interfaces, portable recorder rooms, various peripheral devices, communications, dedicated toll system mini-computer, EDP computer interfaces, software, firmware, modifications to the existing remote recorder rooms in the Utility Buildings and installation of portable remote recorder rooms at several plazas. In addition, the Contractor will be responsible for the maintenance of the existing fare collection system until the New System is completely installed and operable.

Construction and installation will be performed while other contractors may be working within the limits of the project area and that the work of this project shall be coordinated with that of the other contractor.

The procurement procedure shall be a two-step negotiated process, as follows:

STEP I: Interested parties shall submit a complete Technical Proposal and Qualification Statement without pricing data. The Commission will use this submission to evaluate the system proposed and to qualify the company.

STEP II: The Commission will invite companies qualified in Step I to submit proposals including price. Subsequently, and as deemed necessary by the Commission, companies may be asked to make a formal presentation for explanation and clarification of their proposal.

Drawings, Technical Provisions and a sample of the Contractual Documents will be available and open to public inspection on or about May 4, 1981, at the Administration Building. The Request for Proposal Package may be purchased for $100.00 per set. Payment shall be by check or Postal Money Order (NO CASH) to the Pennsylvania Turnpike Commission at the address shown above. NO REFUND will be made for RFP Documents unless the project is withdrawn by the Commission.

A mandatory scheduled Step I site inspection of all interchanges is a qualification requirement for negotiating this Contract. Site inspections will be conducted by Commission representatives from May 18 to May 29, 1981. Failure to be represented at the inspection of all sites will be cause for rejection of proposal. The inspecting party will meet at the employees' parking lot at Gateway Interchange, (near Ohio line) Milepost 1.4, at 8:00 A.M., local time, on May 18, 1981 and proceed across the Turnpike system so that the inspection can be concluded at the Scranton Interchange, Milepost A-110.3 by May 29, 1981.

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RAY H. SOLLENBERGER
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If you're out to make a name for yourself in computers, why not join a company that is, too? Call us at (800) 828-6541, or, if you live in New York State, call us collect at (716) 724-4605. Or send your resume to: Personnel Resources, Eastman Kodak Company, Dept. CC3081, Rochester, N.Y. 14650.

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Micro Code/Firmware Development
Manager, S & P
Manager, Tech Support
Consultants
Telecommunications, Voice/Data

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Hartford, CT 06105
(203) 549-4240

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(201) 761-4400

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New York, NY 10007
(212)227-7370

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PROGRAMMER ANALYSTS
(Medical Research)

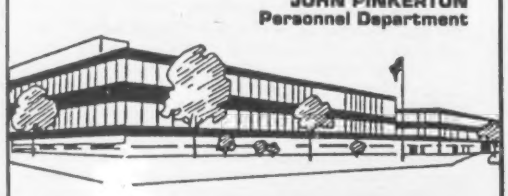
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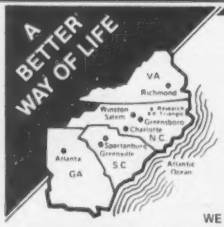
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Responsibilities: Supervise the design and implementation of projects for manufacturing plants. Involves supervision of 2 systems analysts to complete the following initial projects: Remote plant accounting systems; an on-line distribution system for multiple plants; manufacturing support systems for a complex job shop.

Experience: Minimum 3 years application of systems methodology to improve manufacturing and administrative functions. Previous project, budget and supervisory experience. Ability to analyze, design and implement manual and computer systems.

Education: BS/BA, preferably in related field, MBA or MS desirable.

SYSTEMS ANALYSTS

For the following responsibilities:

- To plan systems organization and propose technology for the Division. Perform strategy study to recommend hardware, methods of communication and organization of systems. Prepare plan for the separation of Films systems from Plastics Division's systems. Provide technical guidance to central and remote systems staff. Coordinate annual planning for the Division (includes U.S., Canada and Europe.)
- To develop interactive modeling systems for the Division using APL (Company currently runs APLSV, going to VSAPL) or other appropriate technology. Design and implement the following: Mfg. reporting systems for multiple plant locations; Plant income forecasting and analysis system; sales analysis system; profit planning system.
- To analyze business and manufacturing systems, propose improvements, design and implement required changes. Emphasis will be on mfg. plant locations and use of minicomputers. Assist local plant personnel and provide technical guidance. Initial projects involve remote plant accounting systems and an on-line distribution system for multiple plants.

Experience: Previous application of systems methodology to manufacturing and administrative functions. Supervisory or project leader experience. Ability to analyze, design and implement manual and computer systems. Knowledge of small computers desirable.

Education: BS/BA in related field, MBA or MS desirable.

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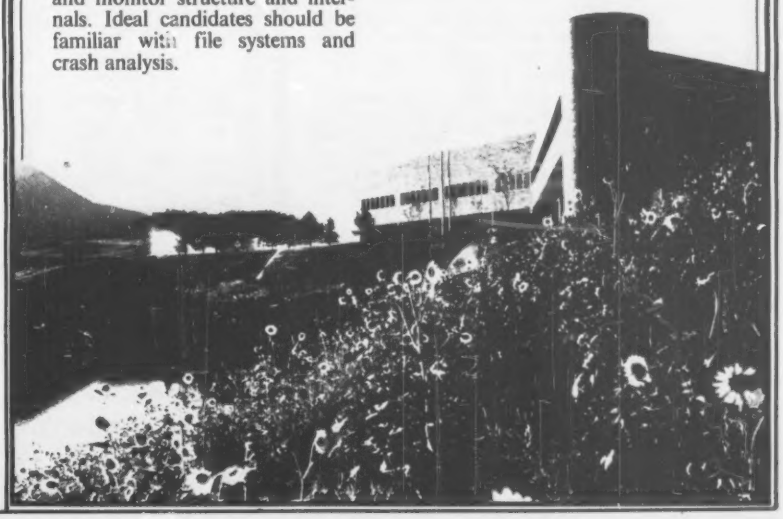
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Computer Graphics Engineer to develop graphics systems for enhancement of products and services including designing systems, programs, record layouts, and operational specifications, flow chart preparation, and system development, test, and implementation; recommends equipment configuration changes/enhancements; trains staff in use of equipment. Proficiency in Basic, Fortran, Cobol required. Minimum two years experience or one year + M.S. Computer Science.

$1,500/month to start.

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TENNECO

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If you prefer to send a resume, please address it to Angela Delaney, Manager Corporate Staffing, c/o Dept. 464 at the address below.

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PSL

REAL-TIME PROGRAMMER II or III: BS in CS or engineering; or math with computer oriented courses plus 3 years experience in programming mini or medium computers for real time applications; or any equivalent education and/or experience which provides the following: knowledge of TRIM III, FORTRAN and CMS-2; assembler programming for UNIVAC and PDP11, real-time operating systems; able to supervise and work with minimum supervision. Refer to 232. Salary is $16,284 and up DOE. Deadline is May 5.

Personnel Department (232-29)
Physical Science Laboratory/NMSU
Box 3—PSL
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Physical Science Laboratory

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SOHIO

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Ideal background includes 5 years of programming/systems design experience using Modcomp IV or Classic type computers plus several years in FORTRAN and ASSEMBLER coding for Modcomp computers. A detailed knowledge of the MAX-IV operating system is essential, along with experience in design, programming implementation, testing and installation of real-time process data acquisition and control. Nuclear industry experience desirable.

Programmers/Analysts

Openings at several levels require 1-3 years' experience using Modcomp computers for real time data acquisition systems. Excellent knowledge of FORTRAN/ASSEMBLER is important.

Finance Programmers/Analysts

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In this capacity you will maintain existing MIS programs, provide and expand existing MIS documentation, and generate special reports from MIS database on request.

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We are a Fortune 500 Corporation engaged in the development, manufacture and marketing of Computer Graphic Systems. Our position as the industry leader allows us to currently offer career positions in our sales offices with excellent opportunities for personal contribution, responsibility and growth. We are looking for leaders in **your** field in the following areas:

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(312) 829-5000
Monday through Thursday, May 4-7, 9AM - 5PM

Tektronix
COMMITTED TO EXCELLENCE

If we can't meet you at the NCC, please direct your resume to **Roy Bauerle, 3003 Bunker Hill Lane, Santa Clara, CA 95050** or call **(800) 538-8125. In California, call collect (408) 496-0800.** We are an equal opportunity employer m/f/h.

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If you're a computer professional, doesn't it make sense to put your career in perspective at The Fed? For more information, please send your resume to The Federal Reserve Bank of San Francisco, 400 Sansome Street, P-GC, San Francisco, CA 94111. We are an equal opportunity employer.

Federal Reserve Bank of San Francisco

PROGRAMMER/ ANALYST

A division of Eaton Corporation manufacturing Cutler-Hammer controls is seeking an experienced Programmer/-Analyst. Applicant should have extensive RPG II programming experience and a working background with IBM System 3, Model 15D; on-line processing; MRJE; and JCL Telecommunications concepts.

Current COBOL programming knowledge and experience; CICS; DL-1; and other software techniques backgorund will be prime considerations for employment.

Manufacturing systems experience is a prerequisite requirement. This installation will convert to an IBM 4331 later this year and install a very sophisticated manufacturing system software package in early 1982.

This position offers a career opportunity with excellent fringe benefits for the right individual. For confidential consideration, send resume with salary history to:

Employment Manager
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Standard Power Control Division
2901 Industrial Drive
Bowling Green, KY 42101
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EATON Electrical/Electronic Control

INFORMATION SYSTEMS MANAGER

Two years experience, 4 yrs High School or equivalent. Must have knowledge of COBOL and ASSEMBLER. In charge of design & implementation of computer systems related to financial institutions. Consults with managerial & programming personnel to clarify program intent. Divides up program assignments. Responsible for analyzing test runs & directing any necessary corrections. Also reviews programs to increase efficiency & conserve storage space. $38,000 per year to work 35hrs/5 days/wk. Please send resumes to: **Computer Technicians, Inc., 940 Highway 18, East Brunswick, N.J., 08816.**

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Salary of $24,000 per year, 40 hours per week.

Position is to engineer and design, including software development of an all inclusive computer based security system, which is to include doing own programming in FORTRAN/BASIC and/or Machine Language, flowcharting, development of business and machine device operating systems. This is a stand-alone position with no support from other divisions or personnel. Applicant must have M.S. in Systems Engineering and experience of two years in systems engineering or electronic security systems. Contact Texas Employment Commission, P.O. #2181448, Houston, TX. Ad paid by an Equal Opportunity Employer.

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Two years experience. 4 yrs High School. Must have knowledge of COBOL. Design & implement computer systems for conversion from manual systems as well as enhancement of existing computer systems to ensure efficient operation. $26,000 per year to work 35 hrs/5 days/wk. Please send resumes to: **Computer Technicians, Inc., 646 Highway 18, East Brunswick, N.J., 08816.**

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COLORADO

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A minimum of 3 years experience in technical computer systems development utilizing large scale IBM computer systems, preferably in oil, gas or chemical industries, required in addition to a degree in Engineering. An advanced degree in Engineering or MBA highly desirable. Computer modeling and simulation in a scientific or engineering environment preferred. Supervisory and project leadership skills and project life cycle methodology experience a definite plus. (Similar positions are available in our corporate headquarters in Houston, Texas).

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Programmer/ Analyst — You will work closely with systems analysts in designing program structure and coding application programs in COBOL or higher level languages. You will be using interactive CRT terminals to develop on-line DBMS-based application systems.

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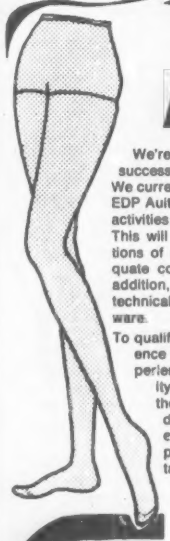
- Have knowledge of Fortran
- Be well qualified in mini-computer assembly language (preferably DEC 11/70 & systems programming concepts)
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Personnel Department
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DATA PROCESSING

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BS in Computer Science, Math or Engineering is desired.

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Strong RPG II/RPG III background with 3-5 years experience.
Manufacturing background is a plus.

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Attention: Joan Grotff — Recruiting Assistant

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Our employees know of this ad.
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Send letter of application, current resume, copies of transcripts, and three recent letters of recommendation and/or placement file to:

Thomas Brown, Personnel Director
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N. Las Vegas, NV 89030

SALARY RANGE:
$18,000 - $24,000
DEADLINE FOR APPLICANT'S COMPLETE FILE:
May 8, 1981
TARGET DATE FOR EMPLOYMENT:
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This position requires a minimum of three years experience in systems design and a minimum of one year experience in on line systems design using CICS. Accounting background also helpful. The position also requires a knowledge of RPG II and assembler languages. A knowledge of apparel systems would be an advantage. The salary offered will be competitive based upon your systems knowledge and experience.

Please mail resume (No telephone calls, please) to:

Melinda Brooks
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REQUIRED QUALIFICATIONS: Education — Bachelor's degree or equivalent. Experience — At least five years progressively responsible experience in 1) analyzing system requirements and computer applications for systematic processing of data and 2) developing computer programs of which one year shall have included supervisory responsibilities. Knowledge — High level competence in COBOL and an understanding of technical and analytical work processes and methods involved in subject-matter applications. Ability — To handle above responsibilities efficiently and effectively and to work cooperatively with people of diverse cultural backgrounds.
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Submit resume with cover letter which includes title of position sought, a narrative description detailing relevance of your background to the qualifications and names and addresses of three professional references. Applications must be postmarked by May 22, 1981. Send to: Karen Young, Personnel Office, Dept. 323, East-West Center, 1777 East-West Road, Honolulu, Hawaii 96848.

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Ad closing is every Friday, 6 working days prior to issue date.

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To reserve space for your ad, or if you'd like more information on Classified advertising in COMPUTERWORLD, call our office nearest you.

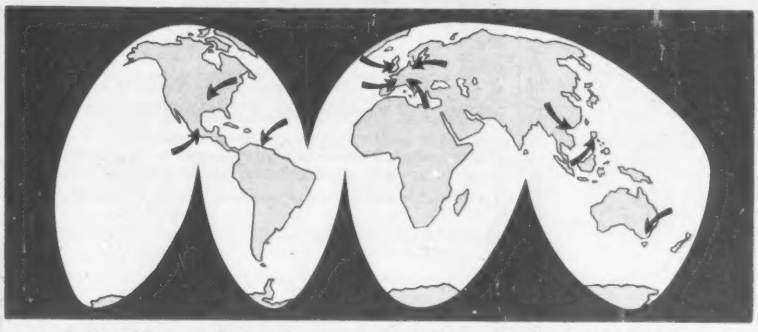
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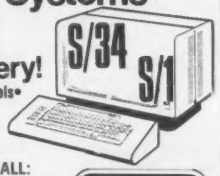
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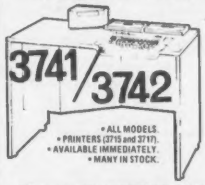
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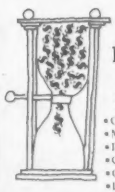
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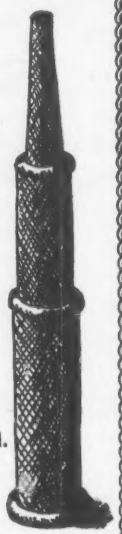
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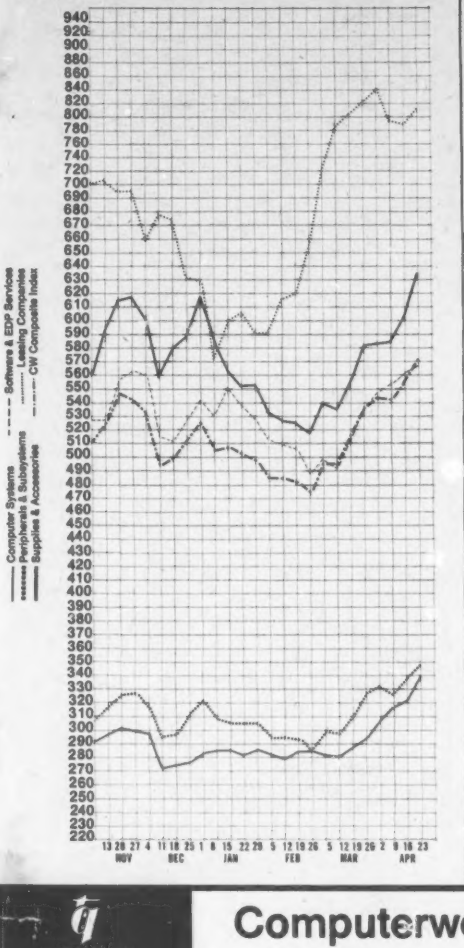
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Computerworld Headquarters
375 Cochituate Road, Box 880
Framingham, Mass. 01701
Phone: (617) 879-0700
Telex: 95-1153

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COMPUTERWORLD
375 Cochituate Road
Box 880
Framingham, Mass. 01701
Phone: (617) 879-0700
Telex: 95-1153

BOSTON
Robert L. Ziegel
Northern Regional Director
Chris Lee
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District Managers
Kathy Doyle
Diane Sukey
Account Coordinators
COMPUTERWORLD
375 Cochituate Road
Box 880
Framingham, Mass. 01701
Phone: (617) 879-0700
Telex: 95-1153

NEW YORK
Donald E. Fagan
Eastern Regional Director
Peter Senft
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District Managers
Candy Kelly
Account Executive
COMPUTERWORLD
Paramus Plaza I
140 Route 17 North
Paramus, N.J. 07652
Phone: (201) 967-1350

CHICAGO
Dave Dolber
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Account Coordinator
COMPUTERWORLD
2600 South River Road
Suite 304
Des Plaines, Ill. 60018
(312) 827-4433

LOS ANGELES
Jim Richardson
District Manager
Bob Hubbard
Account Manager
Kathie Knox
Account Coordinator
COMPUTERWORLD
3420 Ocean Park Boulevard
Suite 3020
Santa Monica, Calif. 90405
Phone: (213) 450-7181

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Suite 600
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Phone: (415) 421-7330

JAPAN
Mr. Shigema Takahashi
General Manager
DEMPA/COMPUTERWORLD
1-11-15 Higashi Gotanda
Shinagawa-ku, Tokyo 141
Phone: (03) 455-6101
Telex: J2424461

UNITED KINGDOM
Steve Burton
IDG PUBLISHING LTD.
146 Clerkenwell Road
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Phone: (01) 837-1222
Telex: UK-269477

Euan C. Rose
BEERE, HOBSON ASSOCIATES
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Eckhard Utpadel
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Telex: W.Ger-5-215250-HKFD

AUSTRALIA
Alan Power
COMPUTERWORLD PTY. LTD.
37-43 Alexander Street
Crows Nest, NSW 2065
Phone: (02) 439-5133
Telex: SECCO AA25468

BRAZIL
Eric Hippeau
COMPUTERWORLD do BRAZIL
Servicos e Publicacoes Ltda.
Rua Alcindo Guanabara
25/10th floor
20031 Rio de Janeiro, RJ
Phone: (021) 240-8225
Telex: 11-32017 (WORD BR)

MEXICO
Kevin Kelleghan
COMPUTERWORLD de MEXICO
Oaxaca 21-2
Colonia Roma
Mexico City 7 D.F.
Phone: (905) 514-4218
(905) 514-6309

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, APRIL 22, 1981

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

E X C H		1980-81 RANGE (1)	CLOSE APR 22 1981	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	15- 42	35 7/8	-1 1/4	-2.9
N	BURROUGHS CORP	47- 88	55 3/8	-1	-1.8
O	COMPUTER AUTOMATION	9- 27	14 3/4	- 1/2	-3.2
N	CONTROL DATA CORP	35- 77	78 3/8	+4 7/8	+6.8
O	CRAY RESEARCH INC	10- 48	41 3/8	+1 1/2	+3.7
N	DATA GENERAL CORP	46- 87	57 1/4	-3 1/4	-5.3
N	DATAPOINT CORP	22- 65	65 3/8	+ 5/8	+0.9
N	DIGITAL EQUIPMENT	52-106	106 1/4	+11 1/2	+12.1
A	EECO INC	6- 18	17 7/8	+3 5/8	+25.4
N	ELECTRONIC ASSOC.	6- 12	8 1/8	- 1/8	-1.5
N	FOUR-PHASE SYSTEMS	19- 49	38 7/8	+4 1/2	+13.0
N	FOXBORO	31- 82	61 3/4	+6 1/4	+11.2
O	GENERAL AUTOMATION	7- 18	15 1/8	+1 5/8	+12.0
O	GRI COMPUTER CORP	1- 3	1 1/2	0	0.0
N	HARRIS CORP	25- 80	58 5/8	+1 1/8	+1.9
N	HEWLETT-PACKARD CO	46-101	101 1/4	+4 3/8	+4.5
N	HONEYWELL INC	65-115	88 3/4	+ 1/4	+0.2
N	IBM	50- 79	60 3/8	+ 3/4	+1.2
O	MAGNUSON COMP SYSTS	20- 48	31 1/2	+3	+10.5
N	MANAGEMENT ASSIST	9- 25	17	+ 1/8	+0.7
O	MINI-COMPUTER SYST	1- 6	2	+ 1/8	+6.6
N	MODULAR COMPUTER SYS	8- 31	14 7/8	+1 1/8	+8.1
N	NCR	52- 82	69 7/8	+2 1/8	+3.1
N	PRIME COMPUTER INC	10- 41	38 7/8	+1 3/4	+4.7
N	PERKIN-ELMER	13- 35	32 1/8	+3 1/4	+11.2
N	SPERRY CORP	42- 65	58 5/8	+2 1/4	+3.8
O	TANDEM COMPUTERS INC	13- 88	88 3/4	+5 1/2	+6.6
N	TEXAS INSTRUMENTS	78-150	121 3/4	+ 1/4	+0.2
A	WANG LABS.	17- 80	36 5/8	+1 7/8	+5.3
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	13- 27	25 1/4	+ 3/4	+3.0
N	COMDISCO INC	6- 24	23 1/2	+2 1/2	+11.9
A	COMMERCE GROUP CORP	1- 2	1	0	0.0
A	COMPUTER INVSTRS GRP	1- 4	3/8	0	0.0
O	CONTINENTAL INFO SYS	2- 15	6 3/4	0	0.0
M	DATRONIC RENTAL	3- 5	4 1/4	0	0.0
A	DCL INC	3- 8	2 7/8	0	0.0
N	DPF INC	5- 12	10 1/2	+ 1/2	+5.0
O	ITEL	1- 15	1	+ 1/8	+14.2
A	LEASPAC CORP	1- 2	3/8	0	0.0
A	PIONEER TEX CORP	2- 4	3 5/8	+ 3/8	+11.5
N	RELIANCE GROUP INC	24- 79	73	-2 7/8	-3.7
N	U.S. LEASING	12- 30	27 3/8	- 1/8	-0.4

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

E X C H		1980-81 RANGE (1)	CLOSE APR 22 1981	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 6	5 3/8	+ 7/8	+19.4
O	ADVANCED SYSTEMS INC	12- 15	14 3/4	+2 1/4	+18.0
O	ANACOMP INC	7- 24	21	+ 1/8	+0.5
O	ANALYSTS INTL CORP	3- 14	8 3/4	0	0.0
A	APPLIED DATA RES.	8- 24	18 1/8	-1 7/8	-8.8
N	AUTOMATIC DATA PROC	31- 60	60 1/4	+1 1/2	+2.5
O	COA COMPUTER ASSOC	8- 17	11 3/4	- 3/4	-6.0
O	COMPUTER HORIZONS	1- 5	2 1/8	- 1/4	-10.5
O	COMPUTER NETWORK	4- 8	5 7/8	- 1/8	-2.0
N	COMPUTER SCIENCES	11- 30	21 3/4	+1 1/4	+6.0
O	COMPUTER TASK GROUP	1- 23	18 1/4	0	0.0
O	COMPUTER USAGE	2- 10	4 1/4	- 1/4	-5.5
O	COMSHARE	11- 21	16 1/4	- 1/2	-2.8
O	CULLINANE DATABASE	18- 80	80 1/4	+2	+3.4
O	DATA DIMENSIONS INC	1- 8	1 3/4	0	0.0
O	DATATAB	1- 4	7/8	- 1/4	-22.2
O	DSI CORP	4- 8	5 1/8	- 1/8	-2.3
O	DYATRON CORP	4- 11	8 3/4	+1	+12.8
N	ELECTRONIC DATA SYST	18- 50	47 5/8	0	0.0
O	INFORMATICS INC	9- 33	30 1/2	- 3/4	-2.3
O	INSYTE CORP	1- 3	2 1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 4	1 1/4	0	0.0
O	KEANE ASSOCIATES	3- 9	5 1/2	+ 1/4	+4.7
O	KEYDATA CORP	1- 5	3/4	0	0.0
A	LOGICON	12- 34	33 3/8	+1 3/8	+4.2
O	MATHEMATICA INC	5- 18	14 3/4	- 1/2	-3.2
O	MATHEMATICAL APP GRP	7- 33	21	+ 1/2	+2.4
O	NATIONAL DATA CORP	5- 25	25 1/4	+ 1/2	+2.0
N	PLANNING RESEARCH	5- 13	8 7/8	- 1/8	-1.7
O	PROGRAMMING & SYS	1- 1	7/8	- 1/8	-12.5
O	RAPIDATA INC	4- 11	7 3/4	+ 1/4	+3.3
O	REYNOLDS & REYNOLD	18- 34	21 1/2	+1	+4.8
O	STSC INC	8- 28	20	+ 1/2	+2.5
O	SCIENTIFIC COMPUTERS	3- 17	12 1/2	+1	+8.8
N	TYMSHARE INC	17- 56	54 3/4	+2 1/2	+4.7
A	URS CORP	5- 17	15 3/8	+2 1/4	+17.1
N	WYLY CORP	4- 20	13	- 5/8	-4.5
	PERIPHERALS & SUBSYSTEMS				
N	AM INTERNATIONAL	11- 24	14 3/4	- 5/8	-4.0
A	ANDERSON JACOBSON	8- 29	18	- 1/2	-2.7
O	AUTO-TROL TECHNOLOGY	18- 82	28 1/4	+5	+21.5
O	BEEHIVE INT'L	2- 18	18 1/4	+1 3/4	+12.0
A	BOLT,BERANEK & NEW	12- 37	36 1/2	+1 1/2	+4.2
N	BUNKER RAMO	17- 52	48 3/4	+1 5/8	+3.4
O	CAMBRIDGE MEMORIES	1- 8	4 3/4	- 1/4	-5.0
N	CENTRONICS DATA COMP	13- 55	34 1/4	- 7/8	-5.5
A	CETEC CORP	3- 8	7 7/8	- 1/8	-1.5
O	COMPUTER DEVICES INC	5- 10	8 3/4	- 1/8	-1.4
O	COGNITRONICS	1- 11	10 5/8	+1	+10.3
O	COMPUTER COMMUN.	2- 10	2 1/8	-	-2.8
O	COMPUTER CONSOLES	4- 29	24 1/4	+1 3/4	+7.7
O	COMPUTER TRANSCEIVER	1- 6	4 7/8	- 1/8	-2.5
N	COMPUTERVISION CORP	24- 83	33 1/8	+9 1/4	+11.0
N	CONRAC CORP	13- 25	21 1/2	- 1/2	-2.2

E X C H		1980-81 RANGE (1)	CLOSE APR 22 1981	WEEK NET CHNGE	WEEK PCT CHNGE
A	DATA ACCESS SYSTEMS	8- 23	13	- 3/4	-5.4
A	DATAPRODUCTS CORP	11- 44	43 7/8	+3	+7.3
O	DATUM INC	2- 5	2 3/4	+ 1/4	+10.0
O	DECISION DATA COMPUT	2- 8	3 5/8	- 1/8	-3.3
O	DELTA DATA SYSTEMS	1- 3	2 5/8	0	0.0
O	DATARAM CORP	8- 37	11 1/8	+1	+8.8
N	ELECTRONIC M & M	3- 8	5 1/2	0	0.0
O	EVANS & SUTHERLAND	21- 84	81	+8 1/2	+11.8
O	FABRI-TEK	1- 4	2 7/8	- 1/8	-4.1
O	GENERAL COMPUTER SYS	1- 12	10 1/4	+ 1/4	+2.5
O	GEN'L DATA COMM IND	8- 22	17 1/4	+ 3/8	+2.2
O	GENERAL TERMINAL CP	1- 4	1 3/8	+	+4.3
N	HAZELTINE CORP	12- 33	29	+3 1/4	+14.8
O	INFORMATION INTL INC	8- 15	11 1/2	- 3/4	-8.1
O	INTEL CORP	23- 50	40 1/2	+1 3/4	+4.5
A	LUNDY ELECTRONICS	4- 17	11	+ 7/8	+8.8
O	MBI DATA CORP	9- 20	20	+1 3/4	+9.5
N	MEMOREX	10- 34	13 1/2	- 1/2	-3.5
N	MOHAWK DATA SCI	10- 31	26 3/8	+1 3/8	+5.5
O	NETWORK SYSTEMS CORP	14- 25	23	+2 3/8	+11.5
O	OMEX	2- 12	8	0	0.0
A	PARADYNE CORP	8- 43	41 5/8	-1 3/8	-3.1
A	PENRIL CORP	9- 17	15 5/8	+ 3/8	+2.4
O	RAMTEK CORP	10- 23	18 3/4	0	0.0
O	RECOGNITION EQUIP	5- 21	14 3/4	- 1/2	-3.2
O	SCAN DATA	1- 5	2 3/8	-	-2.4
N	STORAGE TECHNOLOGY	12- 30	29 3/8	+ 1/8	+0.4
O	SYKES DATATRONICS	14- 55	53	-1	-1.8
O	T BAR INC	14- 24	19	+1 1/8	+6.2
A	TEC INC	3- 9	4 1/2	+ 1/8	+2.8
N	TEKTRONIX INC	42- 70	57 3/4	+3 1/4	+5.9
N	TELEX	3- 9	7 3/4	- 1/4	-3.1
O	TESDATA SYSTEMS CP	8- 26	10	+ 1/8	+1.2
A	TIMEPLEX INC	5- 22	14 3/8	+1 5/8	+10.5
O	WILTEK-INC	1- 3	3	+ 1/8	+4.3
	SUPPLIES & ACCESSORIES				
A	AMERICAN BUS PRODS	8- 16	15 7/8	0	0.0
O	BALTIMORE BUS FORMS	1- 2	1 1/4	+ 1/8	+11.1
N	BARRY WRIGHT	8- 22	20	- 1/8	-0.6
O	CYBERMATICS INC	1- 2	1 1/8	+ 1/8	+12.5
A	DUPLEX PRODUCTS INC	11- 18	15 1/4	+ 5/8	+4.2
N	ENNIS BUS. FORMS	13- 21	18 7/8	+2 1/2	+14.3
N	3M COMPANY	46- 65	63	- 1/4	-0.3
O	MOORE CORP LTD	27- 38	37 1/4	0	0.8
N	NASHUA CORP	20- 35	24 3/4	+1	+4.2
O	STANDARD REGISTER	22- 35	34 1/4	+ 1/4	+0.7
A	TAB PRODUCTS CO	9- 30	23 5/8	+4	+20.3
N	WALLACE BUS FORMS	12- 26	25 1/4	+1 1/4	+5.2

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